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Information Systems Project Work in a Saudi Organisation: An Ethnographic Study

By

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A thesis submitted in partial fulfilment of the requirements for the
degree of Doctor of Philosophy

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Abstract

This study examines IS project trajectories in a Saudi organisation showing how the project is shaped and re-shaped in day-to-day activities. Three project features are adapted to characterise project phenomena: project complexity, embeddedness and project learning.

Accordingly, the first objective is to investigate project complexities showing how they are dynamically changed due re-defining project properties of goals, methods, deadlines and team relations. The second objective is to understand the interactions between project members and external groups and individual from the surrounding context and how those interactions shape and re-shape local project context. The third objective is to analyse the challenges which bound project members' knowledgeability.

The research methodology incorporates a self-ethnography over twelve months of participation and observation study of three IS projects in a Saudi organisation. Structuration theory is used to guide the research philosophically and to offer an analytical perspective to understand collected data.

Structuration theory is implemented to highlight the dynamic nature of project trajectories taking into consideration that project is not a result of an isolated local context or shaped only according to surrounding organisational procedures: rather project trajectories are results of a series of recursive interactions between the project's local and surrounding contexts, where project member's knowledgeability plays a role in informing actions.

This research can be considered as a theoretical contribution to IS project management literature. This study is situated in new project management literature as distinct from dominant traditional project management prescriptions. This study suggests a view of the project phenomenon merging the three separate project features: project complexity, embeddedness and

learning. On the methodological level, this study introduces the project phenomenon as an ethnographic object stressing its dynamic and social nature embedded in daily activities. Finally, on the context level, this study contributes towards compensating for the paucity of studies about the context of Saudi Arabia in project management and management studies in general.

Chapter One: Introduction

1 Introduction

1.1 Introduction

The origins of this study precede its actual start date in the academia. The researcher used to work as project member (developer) in different IS projects in a Saudi organisation. Then, he moved to work as a project manager leading many IS projects. The researcher worked on IS projects from 1995 to 2008 when he moved to academia to conduct this study. Over that long period, the researcher was continuously monitoring running projects and observing how they were kicked off to achieve a certain task but would end by achieving a different task. He was observing how colleagues would argue about what goals should be implemented in projects and how they should be implemented. He was observing how project members perceived their relationships with non-project members including senior managers, end-users, vendors and contractors and how they assess those relationships and call for changes. Project members including the researcher thought that projects were subject to a high rate of failure and that they would need support and empowerment to avoid project failure.

Since the start of the new millennium and after the end of Y2K project, the organisation moved to a privatisation program which required a renovation of IT services and infrastructure. Many projects have been kicked since then. The

researcher believed that projects were subject to higher chances of failure and he noticed project members' increasing complaints about projects status and progress.

The researcher was interested in the conditions governing project trajectories from initiation to completion and from the time of defining project goals, deadlines, technologies and team members to the time of declaring project as successful or failed. The researcher has found project phenomenon to be a social and dynamic phenomenon where projects were shaped and re-shaped through ongoing daily activities.

The researcher was not only concerned with studying project contexts in general: he was specifically interested in the Saudi context. Saudi Arabia as a main oil producer and which has gained a sudden wealth following the discovery of oil (El-Sanabary 1993) was perceived to have the required economic resources to improve managerial practices and adaptation of latest technology. Oil wealth has been expected to help in modernising the country moving it from being a developing country to be one of the developed countries. No excuse was assumed to be offered for the failure of modernisation process.

Saudi Arabian managerial practices culture was perceived differently. First, it is claimed that oil wealth unevenly changed economical but not social infrastructure (El-Sanabary 1993). Second, it is claimed that Saudi Arabia witnesses changes and improvement as a result of the investment on the

adaptation of Western managerial theories. However this investment suffers from being ineffective and does not result in intended organisational outcomes (Al-Yahya 2009). Finally, Ali (1993) claims that Saudi Arabia experience a dualism between the dominance of coercive force, and centralised political system and ideal values related to Western management theories, and Islamic and traditional values. This calls for more in-depth studies in Saudi Arabia (Ali 1993, Al-Yahya 2009) other than impressionistic and stereotyped studies (El-Sanabary 1993).

The researcher had the chance of receiving a PhD scholarship. The scholarship has been a good opportunity for the researcher to continue his interest in analysing the Saudi IS project phenomenon to an academic level. The academic study has re-shaped the researcher's views, philosophical positions and how he approaches the project phenomenon in the Saudi context.

It is apparent from the literature that there are different schools of thought for approaching the project phenomenon. Those include traditional project management which is criticised for not problematising the project phenomenon and for viewing the project as a universal phenomenon including the implementation of tools and techniques (Engwall 2003). That approach has guided the works of different professional bodies leading them to suggest many project management tools and techniques (White and Fortune 2002). The researcher could link traditional project management to the training which he

used to receive in the Saudi organisation which consisted of a number of preparation courses for the achievement of the Project Management Professional (PMP) certificate accredited by Project Management Institute (PMI).

The critics of traditional project management have paved the roads to new project management approaches. Those include addressing project complexity, project embeddedness and project learning. The researcher has realised that the literature on project complexity is interested in project local contexts. On the other hand, the literature on project embeddedness is interested in the interactions between the project and its surrounding context. Meanwhile, research on project learning is interested in the project as a suitable learning context identifying the challenges which hinder the transfer of generated knowledge from a project to another. Therefore, on the theoretical level, the researcher suggests the importance of considering the three features simultaneously and showing the dynamics between those features and how they contribute in shaping and re-shaping projects trajectories during the project lifecycle where the project is a complex phenomenon embedded in a surrounding context and driven by learning.

On the philosophical level, the researcher has re-shaped his position through the progress of the study. He commenced with a positivist position looking for the characteristics of the surrounding organisational context which lead project

members to behave as they behave giving the primacy to the organisational context over project members' agency. Later, the researcher realised the importance of project members' actions and perceptions which would construct projects. Finally, the researcher has ended up adopting a structurational position (Giddens 1984) which accommodates the effect of the surrounding organisational context as well as the internal project context where project members are aware of how projects are situated in the organisational context and whose actions are shaped by the relationship between the project and its surrounding context. At the same time, project members' actions shape project context and shape its relationships with the surrounding context. Structuration theory (Giddens 1984) proves to be suitable as an analytical lens for investigating project phenomena. Structuration theory is perceived to be able to address the project as a social phenomenon showing the dynamics of project complexities and the interactions between the project context and the surrounding context across space and time. Meanwhile, structuration theory perceives project members as knowledgeable agents whose actions are informed by the monitoring of the outcomes of project daily activities.

On the methodological level, self-ethnography is found to be a suitable research method to capture daily practices and perceptions of project members recording project trajectories across space and time. Self-ethnography proves being suitable for this study for many reasons. Those reasons are stated by Alvesson (2003) and apply on this study:

- a) Self-ethnography, as a specific type of ethnography, is claimed to introduce a closer and deeper representation of social life.
- b) The researcher has a natural access to the organisation enabling him to be an active participant equal to other project members.
- c) Self-ethnography is more capable of recording profound empirical material leading to a better development of theoretical accounts well-grounded in daily observations.
- d) Self-ethnography encourages the reflexivity between organisational practices and theories.

1.2 Objectives

The objective of this study is to show how an IS project in a Saudi organisation is shaped and re-shaped across space and time as a result of the management of the project complexities resulting from internal project properties as well as a result of interactions between project members and outer organisational members, and as a result of learning out from monitoring project activities.

The study explores how project members manage three major project challenges: project internal complexities, project embeddedness and project learning. Accordingly, this study shows in detail:

1. How project complexities resulting from project internal properties (goals, method, deadlines and team relations) are constructed over time and space;
2. How the interactions between project team members and surrounding organisational and non-organisational members are constructed over time and space;
3. What the learning challenges (team members, organisational context, content types, time and space related challenges) are facing project members during monitoring project activities.

This study is not interested in investigating each project feature separately rather it is interested in showing the dynamics between those features and how they contribute in shaping and re-shaping projects across space and time.

1.3 Chapter organisation

The thesis is organised into ten chapters. The first chapter is an introductory chapter listing the reasons which empowered the researcher to investigate the project phenomenon and to be interested in the Saudi context. The first chapter lists the objectives of the thesis ending with a summary of chapter organisation.

The second chapter is a literature review of project management. The second chapter starts with highlighting the importance of project as a way of organising work. Then, it shows that project implementation is problematic and that

traditional project management failed to address project phenomena. Then, it shows how new project management literature comes with different features to characterise projects phenomena. In this context, three project features are reviewed including project complexity, project embeddedness and project learning. The second chapter represents a discussion and analysis of reviewed project management literature showing that project complexity forms the project boundary which is embedded in organisational context and is subject to tension due to interactions between project members and external organisational groups and individuals. Finally, the second chapter ends with introducing the research questions.

The third chapter introduces a literature review of structuration theory which is used as a theoretical perspective guiding this study understanding of the social and dynamic nature of projects phenomena. The third chapter starts by introducing a synthesis of structuration theory concepts. Second, it reviews the challenges facing the implementation of structuration theory in management studies and highlighting some suggestions in management literature for facilitating the use of Structuration Theory in empirical settings. Finally, the chapter ends by introducing a view to project phenomenon as a structuration process showing how Structuration Theory is suitable for addressing the social and dynamic nature of projects and how it accounts for project members knowledgeability as well to the interactions between the project's local and surrounding context.

The fourth chapter presents the research methodology. It starts by stating the epistemological and ontological position laying out why those positions have been adopted. The chapter introduce the research method justifying the use of self-ethnographic method, selection of the research site and the three projects cases. The fourth chapter moves to address potential limitations of research methods and how their effects have been mitigated. Then, details of operational data collection such as access negotiation, data recording, language issues and transcription are highlighted. The chapter moves on to comment on data analysis. Finally, the fourth chapter ends by paying particular attention to ethical issues showing how the researcher addressed issues such as consideration of informed consent, introducing the role of the researcher in relation to participants in the field and how he protects them.

The fifth chapter presents the context of Saudi Arabia. It starts by reviewing the scarce studies about Managerial practices in the Saudi context. Then, it moves to give a brief description of the background of the organisation where the study has taken place.

The sixth, seventh and eighth chapters present the three IS projects. The sixth chapter introduces the Mobile Services project story. The seventh chapter tells the story of the Portal Security project. The eighth chapter introduces the story of the Paperless Correspondence project. The three story chapters follow the same structure. Each chapter is divided into three parts. The first part gives a

chronological description of the project story main events. The second part gives a snapshot view of project complexity and the relationships between project members and the surrounding non-project context. Finally, the third part highlights the dynamics of project complexity, the recursiveness of the interactions with the surrounding context across time and space, and the challenges facing project members learning.

The ninth chapter discusses the findings of the three projects. The chapter is again divided into three parts. The first part describes the dynamics of the complexities encountered in the three studied projects. The second part shows the effect of the interactions with the external context on project trajectories ending with illustrating the challenges which limit project members' knowledgeability while monitoring project activities.

Finally the tenth chapter is a concluding chapter. The tenth chapter starts by summing the thesis findings then it moves to list the contribution of the thesis ending with proposing some future works.

Chapter Two: Project Management Literature Review

2 Project Management Literature Review

2.1 Project Usage

Projects form a very important part of our economic and social life (Lundin and Söderholm 1995). In business, organisations are widely turning to be project-oriented (Williams 2003). Project usage in organisations is observed to be trending up and receiving a wide and an increasing support (Johns 1999).

Project usage is not a characteristic of a specific region or society rather it is a global phenomenon which is commonly used everywhere. In western societies, project usage is assumed to be accepted as a common practice. This leads Lundin and Söderholm (1998) to describe western societies as "projectified" societies. Project usage has turned to be a global phenomenon and has profoundly left an effect on management practices all around the globe (Lundin and Söderholm 1995).

Projects are used to perform a wide range of activities across different business sectors including IT. Many organisations from all various business sectors are found to be moving towards using projects to develop new products (Williams 2003). In IT, in particular, project is used as a basic way for doing work (Newell 2004).

2.1.1 Why are projects important?

Project management literature is full of writings explaining the anticipated benefits of using projects in organisations. They are perceived as important way of organising work. First, projects are found to be reliable and flexible for the completion of tasks and assignments for developing and producing goods and services (Schindler and Eppler 2003). Second, projects are used to complete tasks of any type and any size (Maylor 2001 cited Engwall 2003). Projects are seen to be suitable for doing work in a wide range of sectors (Williams 2003). Third, using projects is supposed to enhance organisational effectiveness in achieving organisational goals (Kolltveit et al. 2007). Finally, project is seen to be suitable for any organisation and any type of assignment.

2.1.2 Problematizing project management

Regardless of all the mentioned importance of using projects as a way of organising work in the previous section, project implementations prove to be problematic suffering from high failure rates (White and Fortune 2002). For example, Ciborra and Lanzara (1991) claim that IT projects are more likely to fail. Meanwhile, Case (2000 cited in Kolltveit et al. 2003) reports that only 25% of projects are successful where 52% suffered from major problems while 23% were perceived to be failing. On the other hand, White and Fortune (2002) report that many projects suffer from exceeding their boundaries and failing either by being late, over-budget or by not meeting their pre-specified

objectives. In specific, White and Fortune (2002) cite three surveys suggesting that half of IT projects are expected to fail.

High failure rates in IT projects are not limited to specific countries or regions they are reported from different countries and regions. Marchewka (2006) reports that, in the 90s, only 9% of IS projects in the US was successful with spending over 250 billion every year. Similarly, Kolltveit et al. (2007) reports that it has been documented that the Norwegian government lost NOK 2500 million during the first half of the 90s on failing IT projects.

Those statistics and many other similar high project failure rates consistently reported in project management literature are required to be taken more seriously and to be analysed deeply to project phenomenon. Especially, when recognising that the CHAOS reports (Standish Group 1999, 2001, 2004, 2006 cited in Reed and Knight 2010) show that despite progressive improvement in project management methods and tools, failure rates have not improved significantly where, over the period from 1996 to 2006, projects continue to suffer from high failure rates with no more than 1% improvement.

2.2 Project Management

Engwall (2003) states that project management has started as a practitioner-driven normative theory and followed by an increasing interest by academia in projects. Similarly, Lundin and Söderholm (1995) describes the start of project

management as generally focusing on planning activities, introducing work breakdown structures, Gantt schedules, etc., very much in line with a rational view of organizational processes. On the other hand, Cooper et al. (2002) add that project management is challenged by the idea of improving project's performance. In this sense, project management is supposed to be about managing project trajectories to reach a successful end. The following sections review different project management approaches described in the literature starting from traditional project management to new schools of thoughts towards project management.

2.2.1 Traditional Project Management

Traditional project management thinking is questioned, and even, according to Newman and Nollen (1996), has been phased out. "Traditional project management is the process of planning, organising, directing and controlling company resources for a short term objective established to achieve specific goals" (Ayas 1996: p. 131). Traditional project management thinking is based on several ideas. First, projects are seen to be universal phenomena where successful tools and methods are to be successful regardless of internal project context or external organisational context (Engwall 2003). Accordingly, White and Fortune (2002) report that many project management tools and techniques have been suggested through different professional bodies. Second, traditional project management is based on the idea that internal project properties such

as goals and deadlines should be well-defined prior to project start-up and do not change over project progress. Accordingly, it is assumed that projects are static following the 'critical path' standard view (Cooper et al. 2002). Third, traditional project management overestimates the role of project manager making him the main responsible role for delivering the well-defined goals within pre-defined constraints of deadlines and budgets (Turner and Cochrane 1993). Fourth, project phenomenon is viewed as simple and easily analysable phenomenon (Lindkvist et al. 1998). Fifth, traditional project management has not taken into consideration the embeddedness of the project in organisational context (Turner and Cochrane 1993) assuming and calling for isolating project context from the outer context. Finally, Sage et al. (2011) state that traditional project management failed to address the dynamic social interactions falling in the problem of reducing human actions to predictable parts discarding the possibility of learning and reflection on past events and communication. In addition, they report that traditional project management has the assumptions that stability and predictability is better preventing organisations from understanding itself and consequently changing.

2.2.2 New Project Management Approaches

Williams et al. (2012) state that projects suffer from: uncertainty, complexity and inability to locate individuals' tacit knowledge. Project problems are results of working under uncertainty in a socially complex team structure where

project goals are uncertain and team behaviours are difficult to understand. They report that project management literature works on introducing new tools to improve managing risks, project planning and control, and project governance. Saynisch (2010) proposes Project Management Second Order (PM-2) as a balanced integration between traditional project management and new insights from natural and social science such as 'theory of evolution and chaos, self-organization, synergetics, theory of complex systems, etc.' He suggests that PM-2 should be built on four different worlds: traditional project management, complexity management, collaborations and foundations ways of thinking. The degree of the application of those four worlds are different depending on project types where some projects would build heavily on the world of traditional project management such as construction projects while IT systems development require the use of all four world with a specific emphasis on complexity management.

In general, project management literature includes various different new project management approaches. This study identifies three approaches. The first approach considers projects as complex phenomena (Baccarini 1996, Williams 1999). The second approach considers projects as embedded practices in an outer non-project context (Ayas 1996, Engwall 2003). Finally, the third approach is project learning which considers project as a suitable context for learning (Cooke-Davis 2002, Schindler and Eppler 2003).

2.2.2.1 Project Complexity

Saynisch (2010) states that complexity is a nature of our world, which does not develop in a linear way but in a non-linear way. Therefore, it is not easily predictable especially in the age of globalization and the huge technological advancement. Antoniadis et al. (2011) realise that project performance is negatively affected by the increase in complexity.

Traditional project management reduces project into its parts analysing each part individually. The decomposition analysis of projects assumes projects to be easily analysable and failure reasons easily spotted and resolved once project is decomposed into different parts where each part can be separately examined. This traditional view considers project to be simple (Williams 2003, 2004).

This decomposition analysis approach is neither adequate nor sufficient in analysing projects activities due to its inability to address project complexity (Williams 2003, 2004). In complex system, it is difficult to shape an understanding of the whole system relying separately on understanding and observing individual parts separately (Simon, 1982). Consequently, it is difficult to understand project through only monitoring its individual parts. Saynisch (2010) argues that the increase in project complexity leaves traditional management tools and methods unable to function efficiently calling for a new paradigm in project management, which should benefit from the new trends and paradigms in natural and social science.

Complexity as a project feature is accepted in the academic literature as well as in practice (Bennett 1991). In academia, many writings have examined and build an understanding of project complexity. In practice, practitioners are observed to describe some projects to be simple and others to be complex projects (Bennett 1991). However, Baccarini (1996) states that project complexity does not receive enough attention where academic researchers avoid project complexity when studying projects.

The increase in project complexity is introduced as a factor leading to project failure (Antoniadis et al. 2011). In general, Williams (1999) reports that projects have changed to be more complex even before reaching an agreement on a specific definition of complexity, adding that the growing number and advancement of project management tools are not able to improve project success rates referring this failure to the failure of addressing project complexity.

Baccarini (1996) finds it important for project management to address and understand project complexity which is claimed to leave an effect on all project activities. Project complexity has an effect on project time, cost and quality (Rowlinson 1988), identification of goals and objectives (Morris and Hough 1987), planning and coordination (Wozniak 1993), project organisational form (Morris and Hough 1987, Bennett 1991) and procurement (Stocks and Male 1984).

2.2.2.1.1 Complexity Definition

Despite the given importance to project complexity, it has no clear definition (Williams 1999). Different views are suggested to help in explaining project complexity. First, Complexity is suggested to be understood as difficulty (Gidado 1993). This simple association between complexity and difficulty is elaborated by Wozniak (1993) who divides project complexity into nine "difficulties" such as clarity of scope and criticality of project. This effort of operationalising project complexity as difficulty is criticised for relying on a subjective interpretation of complexity (Baccarini 1996) which is assumed to be an unreliable basis for research analysis (Sidwell 1982, Rowlinson 1988).

Second, Klir (1985) introduces complexity in terms of differentiation and interdependency between many interrelated parts. Differentiation represents the number of the parts while interdependency reflects the interrelatedness between those parts.

Baccarini (1996) builds upon Klir's (1985) definition of complexity as differentiation and interdependency between many interrelated parts proposing a definition of project complexity as "consisting of many varied interrelated parts" (p. 201) which can be operationalised in terms of differentiation and interdependency.

Project complexity can address different project dimensions such as organisation, technology, environment, information, decision making and systems (Baccarini 1996). The following sections review four complexity dimensions: organisational, structural, technical and technological, and time-related complexities.

2.2.2.1.2 Project as a Complex Phenomenon

Davies and Mackenzie (2013) confirm that project complexities have internal and external sources. Internally, they come from technical and technological, project goals and temporal uncertainties and externally from the degree of stakeholders support, stakeholder shared interests, project members' openness and the changes of project profile in the outer organisational context.

The following sections examine project management literature identifying the complexities stemming from different internal project properties. Those properties are team relations, goals, methods and deadlines. Project properties are approached following Baccarini's approach (1996) to project complexity as consisting of two dimensions of differentiation and interdependency.

2.2.2.1.2.1 Organisational complexity

Antoniadis et al. (2011) report that there is much focus on the technical side of project complexity rather than on the socio-organisational side especially the complexity rising from the interconnections between project teams. They argue

that better understanding of project team interconnections and the socio-organisational issues shaping those interconnections is assumed to help in improving project performance.

Similarly, Hanisch and Wald (2013) view organisational complexity as a socio-political complexity. However, they refer it to the complexity of the surrounding organisational structure viewing project to offer a way of escaping organisational complexity. They identify that the higher degree of project organisational complexity may influence project efficiency when mediated by mediated by relationship quality and transparency.

In general, Cooke-Davies (2002) claims that it is increasingly becoming agreed upon that projects are human-related activities where it is people who deliver projects citing Lechler's article title (1998) "when it comes to project management, it's the people that count". Similarly, projects are assumed to be mainly people centred (Baguley 1995). In projects, project members perform every process (Robertson and Williams 2006) where they are the ones who specify project specifications, execute them and at the end they are the ones who decide on their outcomes if failing or succeeding. Cooke-Davies (2002) states that it is people who determine the adequacy of projects activities and even project success or failure.

In projects, individuals are connected as teams which form the central building blocks for executing projects (Johns 1999). Those teams may be multi-

disciplinary teams (Williams 2003). Therefore, Pinto and Kharbanda (1995) consider defining team structure, effective team building and motivating personnel to be part of projects requirements just as acquiring resources, planning and monitoring progress.

Projects are claimed to be more dependent on team members' experiences rather than on specific project management skills and methods (Engwall 2003). Accordingly, Ayas (1996) states that applying traditional project management techniques and tools is not considered to be sufficient calling for selecting the right people with the right skills to form project teams where project success is dependent on the effective integration of project team skills and experiences.

Baccarini (1996) views the relationships between teams' members as a source of project complexity calling this kind of complexity as project organisational complexity. Baccarini (1996) suggests viewing project complexity from an organisational dimension linking project complexity to project organisational structure which involves the relationships between project members including responsibilities, authorities and communication. Organisational complexity is defined in terms of differentiation and interdependency. Differentiation is divided into two parts: horizontal and vertical. Horizontal differentiation refers to the number of units and specialities in the project where the increase of the number of units and individuals lead to more complexity (Lindkvist et al. 1998). Vertical differentiation refers to the depth of the hierarchical structure. On the

other hand, organisational complexity interdependency is formed by the interrelatedness between the interactions of project members. These interrelatedness and interdependencies may take different forms: pooled, sequential and reciprocal (Thompson 1967). Davies and Mackenzie (2013) suggest that those different forms of interdependencies are managed in three ways: standardization, planning and mutual adjustment. First, standardization involves the enactment of consistent rules, routines and processes. Second, planning involves scheduling activities. Third, mutual adjustment involves collectively working in a team making sense and responding to newly received information and emergent situations. According to Davies and Mackenzie (2013), standardization is appropriate for pooled interdependencies, planning for sequential interdependencies and mutual adjustment for reciprocal interdependencies.

Enberg et al. (2010) confirm that team interdependencies are sources of project complexities and report a consensus on the appropriateness of teamwork as a way of complex project management where complex projects require communication-intensive mechanisms such as 'group problem solving and decision-making' opposite to simpler projects, which require simpler mechanisms such as 'rules, roles and routines'. They found a relation between the nature of project team organisation and how intensive project communications are needed where segregated team are suitable to reduce time and cost of communication-intensive mechanisms. In segregated teams,

knowledge integration is only concentrated on experienced team members leaving inexperienced members out of knowledge exchange and integration.

Organisational complexity represents the complexity in the relations between project members where the complexity lies in how project members are organised to execute assigned project tasks. The increase of the number of project members and groups is seen as an increase in complexity of differentiation while the increase of complexity of interdependency comes from the increase of interrelatedness and dependencies between project members and groups.

2.2.2.1.2.2 Structural complexity

Project goals are considered to form a central part of any project where projects are only implemented to realise sets of goals. Goals are assumed to form an important project success measure where project success is dependent on the achievement of project goals (De Wit 1988).

White and Fortune (2002) assert that the definition of clear project goals and objectives helps as a success measure and helps project members to succeed in achieving them away from confusion or misunderstanding. It is reported that specifying clear goals for project members outperforms the 'do your best' type of assignments (Locke 1968 cited in Gray 2001). Project success is reported to be correlated with the development of clear goals which are planned to be

delivered following project completion (Dvir et al. 2003). The increase of structural complexity calls for a higher degree of coordination (Hanisch and Wald 2013).

On the other hand, project goals are not expected to be static properties but dynamic where they change over project life cycle. Dynamic goals are assumed to be a result of uncertainties of project work or due to obtaining new information. First, project goals may be subject to changes due to the nature of the development process which is a very uncertain process requiring room for improvisation, flexibility and iterations (Eisenhardt and Tabrizi 1995).

Accordingly, project goals are not assumed to be well-defined from the beginning of the project. Second, project goals are subject to changes due to newly available information where goals are adjusted to reflect a better comprehension of all available information readjusting project deliverables to continue to be beneficial for some time after project completion (Turner and Cochrane 1993).

Williams (1999) introduces projects as 'multi-objective with conflicting goals' calling the complexity resulting from goals multiplicity and uncertainty structural complexity. Williams (1999) uses Baccarini's differentiation and interdependency dimensions stating that structural complexity can be seen in the number of goals which the project is after and the interdependencies between those goals. Williams (1999) introduces structural complexity to

reflect the underlying product complexity where the tendency to produce more sophisticated products serving different objectives turns project to be more complex structurally. Similarly, we can add to Williams' structural complexity the increase of project goals due to including different sets of personal goals (Briner and Geddes 1990, Kliem and Ludin 1995 cited in Gray 2001). In summary, structural complexity in this study is viewed as a result of having multiple interrelated goals. That includes goals uncertainties, dynamic goals, and goals multiplicity due to product complexity and personal goals.

2.2.2.1.2.3 Technical and technological complexity

Technical complexity is considered to be another dimension of project complexity. Jones and Deckro (1993) refer technical complexity to the number of tasks and interdependencies between tasks. On the other hand, Baccarini (1996) introduces technological complexity in a way similar to technical complexity where he refers technological complexity as the number of tasks and the interdependencies between those tasks. However, he adds that technological complexity can still be seen in terms of the number of inputs and outputs to each task and the interdependencies between those inputs and outputs while Jones and Deckro (1993) adds the uncertainty of tasks to their technical complexity.

Williams (1999) asserts that the increasing changes in technology lead to an increase in project methods uncertainties. Meanwhile, Turner and Cochrane

(1993) assume that the increase in method uncertainties increases project complexity introducing some project management tools helping in mitigating such complexity. The suggested tools aim to bring order to project and eliminate methods uncertainties. Once, methods are well-defined, they are suggested to be frozen to the end of the project. According to Turner and Cochrane (1993), eliminating project complexity and reaching the freeze stage are recommended to be as early as possible.

Accordingly, technical and technological complexities summarises the complexity resulting from applied project methods. In this study, technical and technological complexities are used as one thing where it increases due to the increase in the number of interrelated tasks, the uncertainties of tasks and the interdependencies of project tasks.

2.2.2.1.2.4 Time-related complexity

Project management is suggested to be a way of generating knowledge and controlling progress towards goals within time limits (Lindkvist et al. 1998). This introduces 'deadlines' as one of the project boundaries measures or constraints which project is expected not to exceed (Lundin and Söderholm 1995). Project deadlines are used as a measure of project performance and success through project lifecycle (Lindkvist et al. 1998) where meeting deadlines is considered as a project management success criterion (De Wit 1988).

Williams (1995) asserts that projects deadlines moves to be tighter than before. (Williams 1999) refers the increasing time pressures to the idea that projects are pressured with a tendency to reduce time to market making projects shorter as part of the competition. Moreover, Manning (2008) asserts that deadlines are subject to negotiation and may be changed to assure project success.

Finally, Williams (2003) states that projects turn to be more complex due to being more time constrained (Williams 2003). Therefore, in this study, time-related complexity is expected to increase as a result of time pressures, deadlines uncertainties and deadlines changes. Meanwhile, time-related complexity is perceived to be interlinked with the dynamic changes in organisational and structural complexity (Hanisch and Wald 2013).

2.2.2.1.2.5 Conclusion

In conclusion, despite the differences between the previously different dimensions of complexities, all may be operationalised as consisting of many interrelated elements. Each complexity dimension address view project complexity from the perspective of a specific project property. Organisational complexity has addressed the complexity related to team relations. Structural complexity reflects the complexity resulting from project goals and objectives. Technical and technological complexities are related to the complexity resulting from applied project methods and technologies. Finally, time-related complexity

represents project complexities rising from project deadlines. Davies and Mackenzie (2013) find that there is no single managerial strategy is able to introduce a solution to project complexity where the outer context with its 'managerial style and organizational culture' has an effect on how individuals and groups manage projects. They add that complexity requires a degree of decomposition and integration. Accordingly, it is important to understand the mechanisms behind projects decomposition and integration. Davies and Mackenzie (2013) conclude that the solution lies in systems integration calling for "disciplined flexibility" (Sapolsky 1972).

2.2.2.2 Project Embeddedness

Project management literature includes writings which views project as a unique phenomenon. Projects are seen to be different than non-project activities (Engwall 2003). Project differences entail that regular organisational practices are not adequate to give projects the required management through all project phases calling for specific and unique management methods (Grabher 2002). Therefore, it is claimed that projects are unique (Löwendahl 1995), different with little commonality (Cooper et al. 2002) and 'one-off, self-contained, temporary and complex tasks' (Bresnen et al. 2004:1537). Projects are claimed to be unique because they are one-off human activities, novel and unitary and have specific quality, cost and time constraints (Turner and Cochrane 1993). Therefore, Barnes and Wearne (1993) claim that project

uniqueness is the cause behind project management failure since no tools and methods are able to offer a solution to all different encountered situations.

Unique projects are only ready for being separately analysed (Graham 1985, Turner 1999).

On the other hand, Cooper et al. (2002) criticise the belief that projects are difficult to be analysed and managed due to their uniqueness stating that it is a wrong belief. Similarly, Williams et al. (2012) assert that projects suffer from being viewed as unique. Engwall (2003) asserts that projects do not exist in a vacuum but in an organisational context where they are not manageable in an isolation of the surrounding organisational context. According to Engwall (2003), projects interact with the surrounding organisational context by importing knowledge, procedures, structures, experiences and values and exporting them again. Therefore, he adds that projects are more dependent on experiences rather than on specific project management skills and methods. Similarly, Manning (2008) reports that projects are embedded in parent organisations which are characterised by organisational structures, strategies, cultures and technologies which leaves an effect on how projects are shaped.

The relation between projects and surrounding organisational context is seen to be the main purpose behind the use of project in the first place (Ayas 1996).

Projects are assumed to be goal driven towards the enhancement of organisational performance and underplaying organisational factors are

assumed to be a reason for IT project failure (Newman and Robey 1992).

Hanisch and Wald (2013) state that projects exist as a result of the surrounding organisational complexity. Therefore, they claim that projects represent a tool for escaping complexity adding that project should have a degree of 'complexity resistance'.

Social and organisational factors are assumed to be important for the IS project success where they affect them during all phases from development to deployment and even later after completion (Luna-Reyes et al. 2005). Social and organisational factors are extremely stressed upon and considered to be mostly behind project failure more than technical factors (Doherty and King 1998).

Meanwhile, Gray (2001) reports that low threat, secure and stable environment, where member contribution is maximised, offers an optimum environment for project success. On the other hand, Hanisch and Wald (2012) investigate social factors affecting project activities building upon project contingency literature. They realise that integration between project and its surrounding context has an influence on project effectiveness. Therefore, Hanisch and Wald (2012) conclude calling for more studies to investigate the effect of different social factors on project outcomes such as culture, social networks, and interpersonal relationships.

2.2.2.2.1 Roles in Projects

Project includes interactions between different individuals involving interactions between members from the project context and members from the outer organisational context. Those interactions between the inner context and the outer context have an effect on project progress. Project management literature describes several roles involved in those interactions. Internal project roles include project manager and team members, while external roles include senior managers and end users.

2.2.2.2.1.1 Project manager role

Engwall (2003) introduces the role of project manager as an important role whom project success is more dependent on his capabilities of systemic planning, team members' selection and application of PM techniques. The role of project manager is introduced as an important role to achieve project success. A well-trained project manager is capable of handling the specific and unique demands of each project (Schwalbe 2000, Jiang et al. 2002). Those demands vary based on the situation including "acquiring resources, motivating personnel, dealing with senior management, obstacles, planning, defining team structure, monitoring progress and effective team building" (Pinto and Kharbanda 1995).

Johns (1999) claims that project manager should be able to manage project teams by clearly defining members' authorities and motivating them to complete assigned tasks. On the other hand, Gray (2001) introduces two types of project managers who are described based on how they manage team members. First, there is a manager who use carrot and stick approach with project members. Eventually, project members are expected to work to earn the reward and avoid punishment. The second type is a manager who empowers his team members and who would expect greater commitment. In both cases, it is important to consider the importance of behavioural variables involved in the interactions between the project manager and team members. Accordingly, Thamhain (2002) suggest that the project manager should act as social architect who is able to perceive the role that behavioural variables play and who is able to manage project team to achieve project success.

Hill (1983) asserts that the main role of the project manager is to manage project complexity claiming that project complexity could be managed by a well-trained and experienced project manager. Stuckenbruck (1988) expects project manager to be "completely preoccupied with the problem of integrating their projects" (p. 208). Accordingly, Baccarini (1996) suggests using integration to manage project complexity involving coordination, communication and control.

Finally, Schindler and Eppler (2003) report that project manager's role is very important in realising learning from projects. Schindler and Eppler (2003) reports that project managers are responsible for generating final project report containing project history and including encountered problems and their solutions. This report is the outcome of a post project review where project managers should lead other project members effectively to participate in. Schindler and Eppler (2003) call project managers to lead by example and make post project review a strategic priority. Moreover, Ahern et al. (2013) assert that the role of project manager is to lead the community of learners (project members) by consensus rather than acting based on a prior well-known knowledge.

However, project manager role is not assumed to be an easy role with no challenges. First, the role of project manager is perceived to be difficult and complex and usually does not have enough authorities to respond to all of his responsibilities (Pinto and Kharbanda 1995). On the other hand, Cooper et al. (2002) assert that project managers are not always able to have a perfect understanding of all projects events and face difficulties in managing project complexity where even successful project managers find it hard to identify project best practices.

2.2.2.2.1.2 Team member role

Projects are people centred (Baguley 1995). Projects are social phenomena where it is people who perform every process (Robertson and Williams 2006). Similarly, Cooke-Davies (2002) asserts that it is people who deliver projects and determine adequacy of the deliverables.

Meanwhile, it is people who are affected by both technical and institutional aspects of the surrounding environment (Scott and Meyer 1994 cited in Engwall 2003). Therefore, Newman and Robey (1992) state that underplayed social factors are reasons for project failure. Meanwhile, Manning (2008) finds it important to study how project members perceive projects and how they relate goals, deadline and team relations and how they participate in disconnecting and reconnecting with the surrounding organisational context.

Projects are done where teams are the building blocks (Johns 1999). Teams are mostly multi-disciplinary (Williams 2003). They interact with different non-project members including end users, members from other departments and sometimes senior management. Interaction and cooperation in teams are introduced as a dominant social factors discussed in project management literature (Hanisch and Wald 2012). However, project members do not have the enough attention similar to the attention given to project manager. The roles of project members are expected to be well-defined either by the applied method as in traditional project management or to be left to be defined by the project

manager (Johns 1999). This is seen to limit project members' participation. To unlock project team members' capabilities, Eisenhardt and Tabrizi (1995) call for flexibility in project activities allowing some room for project members' improvisations. Pinto and Kharbanda (1995) demand the whole project team members to be able to effectively meet organisational objectives.

Hsu et al. (2011) introduce team as a coordinated unit exhibiting collective team cognition enabling them to interact and complete project tasks. This collective team cognition covers team members' understandings of each other, project goals and how to interact with each other. They add that IS project performance is influenced by the levels of team cognition and knowledge utilization. Therefore, building a shared understanding of project activities has a positive effect on project performance where knowledge exchange and utilization are effectively influenced by the team's awareness of how to interact with each other. Accordingly, they associate the quality of teamwork with team performance that is based on their ability to utilize knowledge. Finally, they conclude that managerial practices should facilitate the building of collective team cognition through establishing effective communication practices, setting goals, and clearly defining roles.

2.2.2.2.1.3 Senior manager role

Project management literature gives a special attention to the relationship between project and senior management where they are expected to play a very

important role in leading projects to a successful end. According to CHAOS (cited in Jiang et al. 2002), senior management support are assumed to be one of top three drivers for project success. Similarly, White and Fortune (2002) assert that projects require senior management support to be successful.

Williams et al. (2012) state project owners and senior management may use project assessment methods as governance frameworks to assure the adequacy of decisions in project context and to assure that those decisions are built on top of facts and analysis. However, while project assessment tools are implemented to detect early warning signs, they are proved to be limited in achieving their objectives where they focus on progress and financial development and are unable to spot non-measurable issues.

Moreover, Gray (2001) states that senior management should focus on creating organisational environment to be conducive to successful project outcomes. Johns (1999) assumes that senior management support helps projects gaining organisational support which protects projects from being consumed in non-productive activities dealing with uncooperative members and groups from other organisational departments.

Accordingly, Johns (1999) recommends senior management to write a clear policy supporting project members' authorities and to repeatedly spread a message showing the empowerment of project teams who are acting for the benefit of the parent organisation. Similarly, Hsu et al. (2011) recommend

organisations to implement managerial practices facilitating the building of collective team cognition through establishing effective communication practices, setting goals, and clearly defining roles. On the other hand, Gray (2001) recommends senior managers to avoid mistrusting project members which is perceived to be negatively correlated with project success. Finally, Gray and Larson (2003) warn from the conflict between senior management goals from one side and project members' goals from the other side.

2.2.2.2.1.4 End-users role

The relation between project and end users is considered to be important for project success where Avots (1984) states that project success is more dependent on satisfying end-users needs rather than on documented project performance measures. On the other hand, the CHAOS report (cited in Jiang et al. 2002), shows that user involvement and user participation are two of top three drivers for project success. Therefore, Jiang et al. (2002) claim that understanding the relation between projects and end-users is important considering the underestimating user-related risks as a reason for project failure.

Tait and Vessey (1988) call for involving end-users to be part of the project team. End-users involvement may be facilitated by the use of 'prototype' which is suggested to be used as a tool to reduce users' disappointment after project completion (Alter 1979). The use of prototype establishes an early

communication channels between both project team and users where they can share their opinions about the final outcome. On the other hand, Jiang et al. (2002) recommend project teams to establish a strong relationship with end-users prior to project start to reduce user-related risks and to improve project analysis. A strong relationship between the two sides is claimed to help in closing the gap between users' expectations and project specified goals. Jiang et al. (2002) suggests the form of a "pre-project partnering" (Larson 1997) calling for a formal and institutionalised partnering rather than a simple handshaking.

2.2.2.3 Project Learning

Project management literature stresses on the importance of project learning (Nevison 1994, Ayas 1996, Collier et al 1996). Cooke-Davis (2002) considers learning from projects as one of twelve identified factors for projects success. Meanwhile, Schindler and Eppler (2003) introduce learning from projects as a sustainable competitive advantage which helps organisations building project competencies.

Schindler and Eppler (2003) suggest that projects offer a convenient context for learning due to their limited time and resources. Similarly, Sense (2011) views project as a 'bounded dynamic learning space' where it is psychologically safe for project members to engage in a series of interactions and reflections. On the other hand, Lindkvist et al. (1998) recognises the need for project learning because projects are subject to errors resulting from an 'interactive problem

solving and trial and errors'. Therefore, project-based learning is needed to save cost and time which are wasted in mistakes repetition. Moreover, Ahern et al. (2013) call for approaching complex project management as a form of complex problem solving. According to them, project involves a continuous creation of knowledge not specifiable at the beginning of the project. The continuous knowledge is done under conditions of uncertainty and project complexity comes from knowledge uncertainty or incomplete knowledge. Therefore, from a knowledge management perspective, complex project management is the management of knowledge uncertainty or incomplete knowledge where learning is done by practice. As a result of the emergent nature of project knowledge, project management is a form of 'bounded planning' rather than 'total planning' and the challenge facing project management stems from the need for the governance of knowledge management under uncertainty.

Ahern et al. (2013) state that traditional project management ignores the role of learning in projects. On the other hand, Cooper et al. (2002) assert that learning is not an easy task finding learning from projects success and failure as one of the challenges which face projects. Similarly, Williams (2004) argues that learning from projects does not happen automatically and is required to be carefully managed. However, Schindler and Eppler (2003) claim that learning from projects is not deeply studied adding that project management literature does not show how knowledge is diffused from project to another except from

some general recommendations towards institutionalisation of debriefing activities.

Sense (2011) states that the relationship between projects and teams members involves social and contextual dimensions, which are difficult to quantify ('e.g. personal learning and knowledge development, career advancement, micro-political gains or organizational cultural changes'). Therefore, He claim that project learning is not treated as an important project attribute.

2.2.2.3.1 Project Learning and organisational learning

In their study of project learning, Fuller et al. (2011) use organisational learning concepts such as single loop learning and double loop learning to understand the relationship between project learning and organisational learning. In project context, single loop learning involves fixing project problems with no organisational change while double loop involves fixing project problems by changing organisational procedures, policies and goals. Fuller et al. (2011) add that organisations need to scrutinize their learning approaches looking for a better way of learning from projects (Deutero-learning).

Sense (2011) reports that project learning implies that project members should be ready to manage the dynamic nature of project context turning projects to 'generative learning places' and project members to 'agents for organizational learning'. He identifies three perspectives to organisational learning: cognitive,

behavioural and sociological. Building upon sociological view, Sense (2011) views learning as an outcome of social interactions which through them project members generate meanings and actions. Project members, participating in project work, collectively engage in negotiating meanings, roles and actions and consequently develop their skills both social and technical. Sense (2011) views project team as a 'participative community' creating collective knowledge and project learning as situated learning where learning is conducted by practice in social context 'learning-on-the-job'. Project is perceived as a dynamic environment for learning-on-the-job offering an opportunity of learning development. Then, it is up to organisation and project teams to benefit from this opportunity enhancing project learning, members' skills and consequently organisational learning. Sense (2011) concludes that the improvement of members learning skills are carried by them from a specific project context to another project or organisational context converting learning from being project learning to be organisational learning and turning projects and project teams to be 'agents for organizational learning development'.

On the other hand, Newell et al. (2006) report that in practice IT projects do not lead to the required significant organisational change rather they only result in incremental change. Through their investigation, Newell et al. (2004, 2006) explored the mechanisms linking project knowledge with organisational knowledge and how organisational change may be a result of project activities.

Newell et al. (2004) state that it is important for team members to be equipped with required knowledge and skills. However, they add that this knowledge is not enough where project members need to interact to make sense of project and organisational context creating new knowledge. Through those interactions, project members are involved in a 'strategy of substituting knowledge by access to knowledge' (Becker 2001). Newell et al. (2006) view knowledge as collective where knowledge about specific process is distributed among different members in a group or team and not limited to individual.

Newell et al. (2006) emphasise the importance of knowledge integration among project members and between project members and organisational context where project is not isolated from its organisational context. They study how knowledge integration in projects may be behind the nature of organisational change. Knowledge integration is defined as the process whereby project members combine existing knowledge creating new knowledge (Okhuysen and Eisenhardt 2002). Newell et al. (2004) introduce knowledge integration as a combination of bonding and bridging (Adler and Kwon, 2002) where bonding refers to internal interactions among project members and bridging refers to the interactions between project members and the outer context. Building internal team bonds are an outcome of a process of negotiation and interactions among project members similar to Cook and Brown (1999) 'generative dance'. Newell et al. (2004) add that bonding is a pre-requisite for the activation of bridging where if group members have no strong bonds they would not accept

individuals knowledge obtained from outer context. Meanwhile, strong bonds may guide how project members would utilize their bridges for the achievement of project goals.

Newell et al. (2006) found that knowledge integration is a key factor in IT projects identifying two ways of knowledge integration:

- Mechanistic pooling reducing the interdependencies between project participants where tasks are given to each member to work independently away from other members.
- Generative approach encourages project members to exchange knowledge and participate in the generation of new knowledge.

Newell et al. (2004) state that created new knowledge should be for the benefit of the organisation, which depends on the degree of the stability of employment relations in teams. On the other hand, Newell et al. (2006) conclude that knowledge integration, which is conducted through generative approaches; lead to better chances of organisational change than regular mechanistic approaches where mechanistic pooling is adequate in quick implementation projects with minimum changes. As a result, they call for the investment on project team bonding, maintaining tasks interdependencies among project team members and taking care of the social context.

2.2.2.3.2 Lessons Learned

Several tools and methods are introduced to facilitate learning in projects.

'Lessons Learned' refers to the experiences and insights generated from past projects and which are required to be transferred to new ones. Carrillo et al. (2013) view lessons learned as intellectual assets generated from past experiences relating them to knowledge management and organisational learning where there are interests in promoting 'innovation based on organisation's absorptive capacity' (Cohen and Levinthal 1990). Therefore, they assert that lessons learned objectives are aligned with organisational learning.

PMI's PMBOK (2004) calls for documenting lessons learned and keeping them in a historical database. Post project reviews are introduced as a way of capturing lessons learned where various methods of post project reviews are described in project learning literature. These methods include 'Learning Histories' described by Roth and Kleiner (1998). Similarly, Williams (2004) reports the work of Strathclyde and PA as an example of post project reviews. However, those methods are reported not to be easily implementable in daily practices due to their complexities (Williams 2004).

Schindler and Eppler (2003) distinguish between two project learning tools and methods: process-based and documentation-based. Process-based methods give attention to steps and sequences while documentation-based methods give attention to content both storing and retrieving. This last form is largely applied

and can be found in various organisations such as SWISS Bank, UBS and IBM. Those organisations end project by producing a final report containing recommendations to improve future projects.

In general, the status of post project reviews is not seen to be in a good shape where post project reviews are not considered to be conducted and lessons learned are noticed to be neglected (Pinto 1999). During three years study, Schindler and Eppler (2003) observe that project debriefing is not systematically integrated into organisational knowledge, finding a mismatch between the need for debriefing and its actual implementation. Similarly, Turner et al. (2000) identify the failure of post project reviews calling for tailored learning methods which is capable of overcoming this issue of knowledge loss which is considered to be a serious problem facing project learning.

2.2.2.3.3 Learning Challenges

Fuller et al. (2011) state that organisations should be involved in deutero-learning referring to the process of learning how to learn recommending organisations to scrutinize their learning approaches looking for better ways of learning from projects. As introduced earlier, project based learning is not easily implemented where it may face many challenges (Cooper et al. 2002). Fuller et al. (2011) explain that factors preventing project members from learning from projects involve the number of players, spatial and temporal

issues. This study categorises learning challenges into five areas including challenges related to project members, surrounding organisational support, time, space, and content type.

2.2.2.3.3.1 Learning challenges related to project members

Hsu et al. (2011) state that IS project performance is influenced by the levels of shared team cognition and knowledge utilization where building a shared understanding of project activities has a positive effect on project performance and where knowledge exchange and utilization are effectively influenced by the team's awareness of how to interact with each other.

Project-based learning may be hindered due to challenges related to project members. First, project learning may be hindered by only relying on project manager knowledge and not paying the same attention to other project members (Williams 2003). Ahern et al. (2013) state that project learning should not be reduced to individuals but in the collective of project teams. They add that during project lifecycle, project members are involved in a process of learning the project and forming a community of learners who collectively participate in the creation of missing knowledge through problem solving and Polanyi's (1967) tacit foreknowledge. Not considering the collective nature of project learning is seen to be behind learning less from project where project activities are done by various project members and each member has valuable experiences and insights about project work. Therefore, relying solely on the

project manager's knowledgeability may lead to a loss of valuable knowledge gathered by other project members. The role of project manager is to lead the community of learners by consensus rather than acting based on a prior well-known knowledge (Ahern et al. 2013). Lindkvist et al. (2002) assert that learning success involve generating learning knowledge by all team members. On the other hand, Raelin (2001) suggests that generated knowledge should be made available in public to be accessed by all members. . Therefore, Ahern et al. (2013) call for the development of an effective coordination among project members during project learning which is seen as a process of knowledge creation. This coordination requires “a common will of mutual interest”.

Second, Schindler and Eppler (2003) add that project-based learning is hindered by members' unwillingness to share their insights with others especially during post project reviews due their realisation that there is no personal use out of debriefing events. Williams et al. (2012) explain that this members' unwillingness may be referred to different social issues such as blame culture and power effects.

Third, Williams et al. (2012) argue that project main problem lie in the perception of project members leading them to ignore early warning signs claiming that it is not their role or there is no time. Learning is affected by the failure of project members to observe their own behaviours (Williams 2003) suffering from a gap between espoused theory and theories in use (Fuller et al.

2011). Consequently, they are unable to generate valuable insights about project activities.

Fourth, Fuller et al. (2011) report that project members avoid being associated with failure. Therefore, they adapt defensive routines (Argyris 1992) turning project learning to 'red-light learning' (Julian 2008). Accordingly, Fuller et al. (2011) recommend that project learning should emphasis on learning from good practices as equal as learning from poor practices.

Fifth, post project reviews fail because of the difficulties to access project members' instinctive knowledge and inability to capture this knowledge in a written document (Williams 2003).

Sixth, Schindler and Eppler (2003) assume that project members should be familiar with the learning methods adapted in projects adding that the familiarity with learning method is required for the success of the learning activities where being not trained on the learning method may hinder learning activities. This calls for training on the used lessons learned capturing methods.

Seventh, (Schindler and Eppler 2003) call for a suitable management leadership for successful learning. This may involve the need for neutral external moderator in post project reviews opposite to the traditional view which requires project manager to do this role.

Finally, Hsu et al. (2011) believe that team in project context is different than team in regular permanent co-working in organisational context because they have limited time to develop the shared cognition which forms one of the challenges facing project learning.

2.2.2.3.3.2 Learning challenges related to organisational support

The effect of organisational support on project was discussed previously. When it comes to project learning, organisational support seems to facilitate learning from projects. Senior management support is needed to enable learning in projects. This support could be through identifying and allocating the required resources needed for learning.

Turner et al. (2000) argue that reflection of project learning on organisational policies and procedures is important for completing project learning cycle.

Project learning is challenged by the inability to integrate knowledge generated from project learning to organisational knowledge where Schindler and Eppler (2003) observe that project debriefing is not systematically integrated into organisational knowledge recording a mismatch between the need for debriefing and its actual implementation.

Finally, project learning may require the participation of non-project members to help in administrating post project reviews where Schindler and Eppler (2003) refer post project reviews problems to administrative issues reporting

the need for neutral external moderator in debriefing workshops opposite to the traditional view which requires project manager to do this role. This is echoed by a recommendation by Fuller et al. (2011) to establish an organisational group (such as project management office PMO) acting as a knowledge broker capturing learning from project members and reflecting it on organisational context. They add that having an independent learning facilitator is recommended to ease the effect of defensive routines.

2.2.2.3.3.3 Learning challenges related to Time

Learning is faced by challenges related to time. Collison and Parcell (2001) claim that Project-based learning is based on the idea of learning from past project experiences. However, Stewart (2008) suggests that project learning is suggested to be handled as part of all project phases adding that one of the problems encountered in project learning comes from limiting the process of capturing lessons learned to the end of the project in a post project review. Similarly, Pitagorsky (2000) suggests that recording should be done eventually and not to wait to the end of the project where project learning is assumed to be part of everyday activities where learning from an activity feed next activities. Similarly, Fuller et al. (2011) confirm that project learning should be continuous and throughout the whole project lifecycle and not to be limited to project end. Schindler and Eppler (2003) stress on the importance of continuous project

learning which require changing debriefing from being as a single review at the end of projects to be regular reviews.

On the other hand, Schindler and Eppler (2003) assert that delaying learning, to the end of the project, subjects learning activities to the absence of some project members who are released prior to project closure suggesting the avoidance of project closing phase and the release of project members. Schindler and Eppler (2003) add that not gathering experiences for some time after they have already happened affect the quality of gathered experiences recommending recoding of experiences immediately when events are still recent and can be easily recalled. On the other hand, project learning may be pressured by limited time (Schindler and Eppler 2003) where project members reach a conclusion that there is no time for learning where either time is not allocated for learning or by taking time by other activities during project life cycle. This is echoed by Fuller et al. (2011) who report the negative effect of time pressures and deferral. Moreover, Williams et al. (2012) find that time pressure turn project members away from investigating critical issues and learning. Meanwhile, they argue that performing project reviews is more important than their outcomes because such events allow team members to discuss project issues and raise questions. Therefore, it is important to perform those reviews in early stages. Antoniadis et al. (2011) confirm that project performance drop due to the delay in reporting problems, which are underestimated and seen manageable over time. The effects of unreported problems accumulate over time and increase

due to project complexities and interconnections to result in a drop in the project performance.

2.2.2.3.3.4 Learning challenges related to Space

Project management literature has come over spatial challenges in project learning from two ways. First, Schindler and Eppler (2003) argue that project learning is part of everyday activities and is supposed to be occurring naturally where learning is not limited to post project review meeting rooms rather it happens everywhere. Second, Schindler and Eppler (2003) add that project learning fails due to the inability to reach project members adding that post project reviews may fail because of the release of project members who would leave to work in another project where there is no access to them during post project review.

2.2.2.3.3.5 Learning challenges related to Content Type

Sage et al. (2011) report that project members use different objects (Project plans, schedules, statements or charts) to build common understandings about project goals and deadlines where those objects act as 'social glue'. Those objects represent one of the content types which may be used in projects. In general, the content type of project learning knowledge plays a role in shaping project learning. First, insights and experiences are not easily articulated and communicated as a web of explicit knowledge (McDermott 1999). The

difficulties of capturing insights and experiences are referred to project complexity (Williams 2003) or project uniqueness (Cooper 1994). On the other hand, Fong (2002) recognises an emphasis on converting tacit experiences to explicit knowledge rather than generating new tacit knowledge. According to Cooke-Davis and Arzymanow (2002), project learning requires addressing both explicit and tacit knowledge together where learning is supposed to include a combination of both knowledge types to help in the improvement of how organisations manage projects. Accordingly, Williams (2003) suggests that knowledge management tools (Ruggles 1998) can be utilised to share lessons learned.

Enberg et al. (2010) state that project complexity may be due to knowledge complexity. They report three types of knowledge complexities: differentiation (diversities of specialties, experiences, languages and perceptions), computational (number of codes and symbols) and epistemic complexity (tacitness). Therefore, Williams et al. (2012) stress on the importance of tacit knowledge recognising the need for “gut-feeling” approaches beside formal meetings. “Gut-feeling” approaches are based on dialogue and organisational culture. Through dialogue, project members share understanding and generate collective actions making individual knowledge part of collective knowledge (Sense 2011). Williams et al. (2012) add that “gut-feeling” approaches complement traditional formal project review methods and play a pivotal role in the discovery of tacit knowledge. They add that as projects increase in complexity, the frequency of

using “gut-feeling” approaches needs to increase rather than usual practices of increasing the frequency of formal meetings.

Second, it is found that the quality of generated documents out of post project reviews does not help in facilitating learning where according to Schindler and Eppler (2003), documentation in projects tends to be superficial concentrating on collecting some standardised reports and figures forgetting about recording of failures and successes reasons and mechanisms. Third, Schindler and Eppler (2003) add that lessons learned is assumed to be generically documented and written in an understandable way which is accepted by all members avoiding the 'not invented here' syndrome and shared across different contexts.

However, Williams et al. (2012) report the difficulty of benefiting from reports written away from its context. Fuller et al. (2011) found that documents are important to enable learning among different groups and cross organisations. However, they add that those documents lose their importance in the absence of face-to-face interactions and in the absence of well-defined lines of authority.

2.2.3 Discussion

2.2.3.1 Project success

Project success is considered to be an ambiguous and debated concept in both academic literature and in practice (Pinto and Slevin 1988 cited in Gray 2001).

Many opinions are published explaining conditions and criteria which according to them projects are to be considered successful.

De Wit (1988) differentiates between project success and project management success. Project success is achieved when project achieve specified goals and objectives while project management success involves achieving goals and objectives within pre-specified budget and timeline. On the other De Wit (1988) differentiates between success criteria and success factors. Success criteria are sets of measures and features which if achieved, a project is deemed successful and if not achieved the project is deemed a failure. On the other hand, success factors are sets of factors whose existence help projects to move towards a successful end.

In the following sections, a closer examination of success criteria and factors are introduced. This study differentiates between two types of success criteria and factors in project management literature. Some success criteria and factors are internal to projects while others are organisational. Internal criteria and factors consider project success as an internal property which can be measured and achieved without relating to any organisational attributes or context. On the other hand, organisational project success criteria and factors require relating projects to the surrounding organisational context to decide upon project success. Accordingly, organisational success criteria and factors entail the

importance of understanding the relation between project and parent organisation.

2.2.3.1.1 Project success criteria

Project internal success criteria are considered to form project boundaries which should be maintained and not exceeded under any circumstances for the project to be considered successful. Consequently, it is argued that project problems lie in its boundaries (goals, time and resources) (Lundin and Söderholm 1995). Project internal success criteria ignore any external criteria considering project to be isolated. Accordingly, the role of project members is to prevent any attacks on the project which may lead team members not to commit to the internal success criteria and exceed project boundaries ending with a project failure.

On the other hand, another set of project success criteria are assumed to be organisational where project cannot be evaluated without relating its outcomes to the surrounding organisational context. Kolltveit et al. (2007) state that project success requires the achievement of organisational benefits rather than committing to project timeline. Hence, under those external organisational success criteria, committing to internal project success criteria, such as achieving project goals within project boundaries, is not enough for mark projects as successful. From an organisational view, projects are only successful

if they achieve organisational goals and produce beneficial products for the organisation (Turner and Cochrane 1993).

2.2.3.1.2 Project success factors

Another part of project management literature is interested in identifying sets of factors which may lead to projects failures or help project to succeed. It is reported that, since the 60s, researchers in project management keep looking for the reasons behind projects failures and the factors which lead to or increase the chances of projects successes (Cooke-Davies 2002). Various factors have been suggested to be behind projects failures. Similar to project success criteria, this study differentiates between internal project success factors and external factors rooted in organisational context.

The level of project members' awareness of project management principles and tools is assumed to play a role in leading projects to success or failure where poor implementation of project management tools and methods during project lifecycle is assumed to be behind project failures (Olson 2001, McHenry 2003). The familiarity with project management principles and tools is not only required individually from each project member rather it is expected to be harmonised on team level where project is centred on 'teams' who are a central project building block (Johns 1999). Meanwhile, Engwall (2003) reports that projects fail because project managers are not given enough authorities to handle the assigned big responsibilities.

On the other hand, Doherty and King (1998) report that project failure is more due to social and organisational factors rather than technical factors where in specific Long (1987 cited in Doherty and King 1998) finds that 90% of project failures are referred to be a result of organisational and managerial issues. Meanwhile, Luna-Reyes et al. (2005) assert those projects are affected by organisational factors through all phases of project lifecycle from development to deployment and after completion.

Organisational access to change project internal properties such as goals, deadlines or allocated resources is assumed to form a project failure factor. Lundin and Söderholm (1995) introduce this access as an attack on project adding that project failure is mostly involved in this attack on project boundaries. Project boundary attacks may take the shape of changing project deadlines or goals or through the withdrawal of resources.

Johns (1999) states that organisational support is needed for project success arguing that the central role of organisations is to facilitate and support projects activities adding that "the company exists to support its projects rather than the other way around" (Johns 1999: p. 53).

Huang and Palvia (2001) add that organisational change may be needed for project to be successful where leaving an effect of the surrounding organisation is assumed to be part of an effective project implementation. Therefore, facilitating organisational change is assumed to be a shape of organisational

support for projects. As an example, Kolltveit et al. (2007) observe that organisational change may require more time than anticipated in project plans accordingly organisational support lies in allowing the project to extend beyond its planned time to make the required change.

2.2.3.2 Project complexity as project boundaries

Jones (1997) claims that project complexity results from the increase of internal project conflicts. In this study, project complexity is introduced as a project feature resulting from four project properties namely: goals, methods, deadlines and team relations. Meanwhile, Lundin and Söderholm (1995) those project properties as part of project boundaries. Therefore, instead of viewing project complexity as an internal project feature similar to Jones (1997), it is viewed as a boundary feature.

Recalling from project success section, project's boundaries may be attacked. Meanwhile, project members may require changes in the boundaries to achieve project success. Accordingly, project complexity as a boundary feature is subject to changes dynamically as a result of interactions between project context and surrounding organisational context. Those interactions may take the shape of boundaries attacks leading to project failure or the shape of organisational support leading to project success.

2.2.3.3 Project Properties Interrelatedness (Interdependency)

Previously, project complexity literature was reviewed and four project properties are identified to play a role in shaping project complexity. Each property of goals, methods, deadlines and team relations have been addressed separately from each other while the interdependencies between project properties have not been given enough attention. Few studies have partly discussed the relation between project properties but without relating the discussed relation to project complexity.

As examples of those relations, First, Goodman and Goodman (1976) assume goals cannot be set open with no time constraints where goals and deadlines are tightly linked to each other and changes in one of them leave an immediate effect on the other. Second, Lindkvist et al. (1998) stress on the link between project deadlines and project methods showing that deadlines and time pressures may cause project to follow a specific implementation method such as using fountain model rather than waterfall model due to time limits. Third, Turner and Cochrane (1993) identify the relation between project goals, deadlines and methods suggesting configuration management and milestone planning as implementation methods to mitigate ill-defined goals and help in assigning deadlines to identified sub-goals. Meanwhile, Turner and Cochrane (1993) elaborate more on the relation between goals and methods showing the effect of the relation between goals and methods on team relations. According

to Turner and Cochrane (1993), when both goals and methods are well-defined, a top-down approach is recommended, while multidisciplinary teams are needed when methods are ill-defined but goals are well-defined and a facilitator is preferred when only goals are ill-defined.

Those mentioned examples of in project management literature show the relations between project properties. Meanwhile, they show that the four project properties of goals, methods, deadlines and team relations are linked and any change to one of them may affect the other properties. Meanwhile, this study argues that defining project complexity as a result of a separate project property such as defining project organisational complexity as a result of project team relations or defining project structural complexity as a result of project goals complexity may lead to overlooking the complexity rising from the relations between those properties. Therefore, this study finds it helpful to glue the four organisational complexities (organisational, structural, technical and technological) together and viewing them as a complexity project boundary. Additionally, it helps in maintaining the dynamic nature of project complexity where project complexity is not only dynamic because of the changes in the single project property but moreover by attending to the relations between the four studied complexities similar to Turner and Cochrane (1993) who observes that the process of defining both goals and methods is an iterative process allowing the project to move from type to type.

2.2.3.4 Interactions between organisational and internal properties

The relation between the project context and organisational context is a tensioned relation. Gray (2001) advises senior managers to avoid mistrusting project members where a relation of mistrust between project members and senior management is found to be negatively correlated with project success. Similarly, Gray and Larson (2003) warn from the conflict between senior management goals from one side and project members' goals from the other side. The conflict between organisational goals and internal project goals is termed as a 'productivity paradox' (Dos Santo and Sussman 2000) and is described as the conflict between project and organisational performance measures. Internally, project is perceived successful when it meets its internal goals within budget and time constraints. However, this does not guarantee the development of a product which is beneficial to the parent organisation and meets its goals and objectives.

However, as mentioned previously, projects are introduced as in need for organisational support and subject to boundaries attacks. Organisational context is perceived to affect internal project context and change its boundaries. In other words, organisational context may change project complexity. Project management literature does not give enough attention to the relation between project complexity and organisational context or the relation between project complexity and embeddedness.

Some studies have shown the effect of the organisational context on the project context. As an example, Lundin and Söderholm (1995) observe that organisations choose to use deadlines as a project success criterion that pushes project members to focus on meeting the pre-defined deadlines to declare project success ignoring trading off other project properties and organisational goals. Lundin and Söderholm (1995) add that the use of strict deadlines differs depending on the kind of desired organisational transition and should be carefully used.

This study focuses on both internal project context and external organisational context. This approach is similar to Saynisch (2010) and Antoniadis et al. (2011). Saynisch (2010) divides project complexity into two dimensions: 'project complexity' and 'environmental complexity' advocating that the integration between the management of the two is "the future management art". Antoniadis et al. (2011) argue that project management is an optimisation of the interconnections that connect project members and the outer organisational context Involving ways of improving members' behaviours encouraging them to quickly adapt with change to manage project complexity.

2.2.4 Research questions

In general, this study is interested in showing how an IS project in a Saudi organisation is constructed as a result of interactions between project members and project complexities of internal project properties as well as a result of

interaction between project members and outer organisational members, learning across time and space.

The study explores how project members manage three major project challenges: project internal complexities, interactions with organisational context and learning.

Accordingly, this study shows in detail:

1. How are project complexities resulting from project internal properties (goals, method, deadlines and team relations) constructed over time and space?
2. How are the interactions between project team members and surrounding organisational and non-organisational members constructed over time and space?
3. What are the learning challenges (team members, organisational context, content types, time and space related challenges) facing project members during monitoring project activities?

This study is not interested in investigating each project feature separately rather it is interested in showing the dynamics between those features and how they contribute in shaping and re-shaping projects during project lifecycle.

Chapter Three: Structuration Theory

3 Structuration Theory

3.1 Introduction

For a long time, social theory has shown a special interest in explaining and understanding the relationship between structure and agents (Cohen 1989, Giddens and Pierson 1998, Pozzebon and Pinsonneault 2005).

Many views are offered to address this problematic relationship. Naturalistic sociology considers structure to be the principle determinant of social systems, marginalising the role of agents and reflecting a tendency towards objectivism (Jones and Karsten 2008). On the other side, there is a contrasting approach assuming that structure only exists as an outcome of agency (Jones and Karsten 2008). According to those two competing social perspectives, structure is either represented "as a template for action" or "as a contour of human behaviour" (Barley 1986: p. 79).

Despite this polarisation in social theory, some efforts have been made offering theories bridging the two approaches. These include the works of Bourdieu (1977), Giddens (1984) and Bhaskar (1989). According to Pozzebon and Pinsonneault (2005), those theories are perceived to be alternatives rather than competing approaches. Therefore, choosing one of those theories is a matter of "ontological affinity" (Pozzebon 2004).

Giddens' structuration theory is introduced in the following sections and some of its concepts which are related to this study are discussed.

3.2 Structuration Theory

Structuration theory offers a good explanation to the historically problematic and debated relationship between agency and structure or between individual and society (Pozzebon and Pinsonneault 2005).

Giddens (1984) introduces structuration theory as a social theory which is interested in the recursiveness of the relationship between action and structure in social practices (Giddens 1979, Giddens 1984, Manning 2008).

Fundamental to Giddens' works is to move the relationship between structure and action from a dualism, where there is only one side shaping the other, into a duality where both, structure and action, are involved in a dynamic process interacting with each other (Pozzebon and Pinsonneault 2005, Jones and Karsten 2008).

3.2.1 Structuration Concepts

Structuration theory involves many concepts. Those concepts are introduced in the many writings published by Giddens. In the following sections, those concepts related to the subject of this study are introduced. These include

structure, actor's knowledgeability, duality of structure, temporality, and social and system integration.

3.2.1.1 Structure

Structuration theory starts by introducing a new and specific conceptualisation of "structure", different to how the term was usually used previously (Jones and Karsten 2008). In contrast to the idea that structure is external and separate from agents, Giddens defines structure as an abstract concept which is internal to agents and only exists in their minds (Giddens and Pierson 1998). Structure, in structuration theory, does not exist in time and space. Structure has no reality except in its reproduction through agents' activities or when it is mentally retained (Whittington 1992).

Meanwhile, while holding the idea that structure is an abstract with no shape or form, structure is seen to be what gives social life shape and form (Pozzebun and Pinsonneault 2005). Structure is embedded in practice, or in a series of practices where it is recursively implicated (Giddens 1976, Giddens 1984). "In structuration theory, structure has always to be conceived of as a property of social systems, 'carried' in reproduced practices embedded in time and space" (Giddens 1984: p. 170).

Structures govern the transformation of social systems where people cannot act together without shared structures (Dougherty 2008). According to Giddens

(1984), structure is a set of "rules and resources recursively implicated in the reproduction of social systems" (p. 377).

Rules are divided into two types: interpretative and normative. Interpretative rules are rules of signification: according to them, meaning can be signified. This is similar to the rule which enables agents to recognise the profession of a person through his uniform. Normative rules are rules of legitimation which govern actions specifying what can be done and what cannot.

Resources are either allocative (constituting "transformative capacity generating command over objects, goods or material phenomena") or authoritative (constituting "transformative capacity generating command over persons or actors") (Giddens 1984: p. 33).

3.2.1.2 Actor's knowledgeability

In structuration theory, "structure has no existence independent of the knowledge that agents have about what they do in their day-to-day activity" (Giddens 1984: p. 26). Therefore, Giddens (1984) stresses the importance of individuals' knowledgeability, stating that the success of studying social systems is dependent on referring to this knowledgeability.

Individuals are perceived to be knowledgeable with shared social structures in the society which they participate in. Actors' knowledgeability is what makes it

possible for individuals to participate in social life and interact with each other (Giddens 1984).

Individuals are the carriers and the creators of social structures of rules and resources (Riley 1983). Their knowledgeable ability of those rules and resources is what makes individuals reproduce structures in their daily activities bringing abstract structures into existence. At the same time, agents always "have the possibility of doing otherwise" (Giddens 1989: p. 258).

Knowledgeable agents may also be "aware of sociological accounts of social practices in ways that may influence their understanding of their own actions". Giddens (1990) refers to this as discursive penetration and double hermeneutic.

Structuration theory classifies Individuals' knowledge into three types; discursive, practical and unconscious. First, discursive knowledge refers to "all those things that actors can say, put into words, about the conditions of their action" (Giddens 1983: p. 76). The second type is practical knowledge which refers to agents' internal experiences or "what actors know, but cannot necessarily put into words, about how to go on in the multiplicity of contexts of social life" (Giddens 1979: p. 5). The difference between discursive and practical knowledge is the difference between what can be said and what is simply done. Third is "unconscious source of cognition" (Giddens 1979: p. 5) referring to agents' wants and motives.

3.2.1.3 Reflexive monitoring

Reflexive monitoring is a feature of everyday activities where individuals are involved in a continuous monitoring of the outcomes of actions (Jones and Karsten 2008). Reflexive monitoring is not confined to monitoring an actor's own actions but extends to include monitoring other participants' actions, enabling individuals to maintain their knowledgeability with social structures (Giddens 1984).

Despite Giddens emphasis on agents' knowledgeability, he does not consider this knowledgeability to be absolute. Individual' knowledgeability of the social structures is still bounded by unacknowledged pre-conditions. Hence, actions may lead to unintended consequences. This gives the process of reflexive monitoring a specific importance where the individual continuously monitors the outcomes of actions that may result in unintended consequences as a result of unacknowledged pre-conditions (Fig 3.1).

According to Whittington (1992), taking both agents knowledgeability and reflexivity into consideration is important, because it implies that organisations can be strategically managed in some coherent and explicit way. Whittington (1992) states that "Giddens (1990) resists post-modernist pessimism as to the possibility of humanly engineered progress". This does not mean that organisation is assumed to be fully controlled (Giddens 1985:186) rather it

reflects that individuals are continuously engaged in a process of maintenance, elaboration and modification of organisational work (Barley and Tolbert 1988).

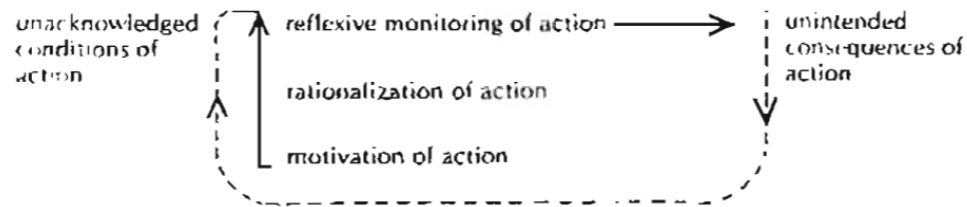


Fig 3.1 Reflexive Monitoring

3.2.1.4 Duality of Structure

Structuration theory posits the recursive relationship between structure and action, or society and individuals. The relationship between structure and action is central to structuration theory (Riley 1983) and its conceptualisation of the duality of structure (Jones and Karsten 2008).

According to the duality of structure concept, structures have both 'constraining features' and 'enabling features' (Giddens 1984), and "the structural properties of social system are both medium and outcome of social practices they recursively organise" (Giddens 1984: p. 25).

Duality of structure is stratified into three dimensions: signification, domination and legitimation where signification provides systems of meaning, domination involves forms of power, and legitimation is related to legitimising actions

(Walsham 2002). Structuration theory presumes that both actions and structures have elements of those three dimensions and that the three dimensions of signification, domination and legitimation are strongly linked and inseparable and separating them is only introduced for analytical reasons (Walsham 2002).

Structuration theory thus attempts to overcome the dichotomy of structure and action that has long dominated the social sciences, and to address the dialectical and complex nature of society (Fuchs 2003). It focuses more on the process-based and dynamic characteristics of social phenomena than on static properties or patterns. Social life is not seen "as society out there or just as the product of the individual here, but as a series of ongoing activities and practices that people carry on, which at the same time reproduce larger institutions" (Giddens and Pierson 1998: p. 76).

Structuration in this view is seen as the conditions governing the (re)production, or modification of structures (Giddens 1984) where it is important to focus on how the signification, domination, and legitimation dimensions of structures come into being and are sustained, rather than viewing them as "givens" or artefacts of the organisation's culture (Riley 1983).

3.2.1.5 Time and space

Temporality has been a common theme of Giddens' writings (Jones and Karsten 2008), and he emphasises the importance of time and space in the study of social systems (Barrett and Walsham 1999, Pozzebon and Pinsonneault 2005).

Giddens (1989) states that it is important to study the context of institutionalised practices across time and space. Structuration theory is not interested in revealing experiences of individuals or groups. It is concerned with describing the ongoing interactions between actions and structures over time and space.

Orlikowski and Yates (2002) elaborate on the temporality theme in structuration stating that "actors produce and reproduce a variety of temporal structures which in turn shape the temporal rhythm forming the ongoing practices" (p. 684).

3.2.1.6 Social and system integration

Giddens introduces two types of integration (social integration and system integration) where "integration is seen as reciprocity of practices including levels of autonomy or dependence between actors and collectives" (Giddens 1984: p. 28). Social integration is reciprocity in the context of co-presence in face-to-face communication, while system integration is reciprocity between

actors or collectivities across extended time and space in the absence of co-presence.

Both Social and system integration play a role in facilitating the production and reproduction of social institutions (Karsten 1995). This is perceived to be facilitated by disembedding mechanisms (such as IT) where an understanding, generated from specific events occurring in a specific moment and location, escapes the particularities of locales, informing future events. According to Barrett and Walsham (1999), the disembedding mechanism involves a separation of time and space which is the condition for the stretching of social relations across wide spans of time and space. Accordingly, disembedding mechanisms work to link social and system integration where system integration presupposes social integration and where there is a link between the temporality of individuals and institutions (Jones and Karsten 2008).

3.2.1.7 Institutional reflexivity

On the individual level, individuals disembed generic accounts and insights which may be shared through social integration, while through institutional reflexivity, specific conclusions may be reached about what is going on, resulting in new rules and procedures. Institutional reflexivity may result in new knowledge undermining local practices and knowledge (Barrett and Walsham 1999). On the individual level, Giddens (1991) suggests that due to existential anxiety individuals question their roles in light of the new knowledge

resulting from institutional reflexivity, adding that the ongoing questioning of new knowledge and practices may lead to the reordering of social relations forming individual reflexivity.

This reordering of social relations may take three modes of enactment: maintenance, elaboration and modification (Barley and Tolbert 1988).

Similarly, Barrett and Walsham (1999) suggest three modes: re-skill, re-appropriation and empowerment. Due to undermining actions resulting from institutional reflexivity, individuals may need to *re-skill*, adopting to the changes. On the other hand, institutional reflexivity may result in *re-appropriation* where individuals get involved in a dialectic of control with the new situation protecting their positions with their knowledgeability of the local context. Finally, individuals may choose to be *empowered* by using their social relations to change the newly produced knowledge.

3.3 Structuration in management studies

Structuration theory attracts much attention in organisational studies (Jones and Karsten 2008). It is perceived to be very helpful in studying organisations (Pozzebon and Pinsonneault 2005), introducing a powerful framework for understanding management and organisation (Riley 1983, Pozzebon and Pinsonneault 2005). According to Bresnen et al. (2004), structuration helps in

understanding the diffusion of management practices within organisations, especially project-based organisations.

The IS literature highlights the usefulness of structuration theory in understanding and analysing IT and organisations (Jones, 1977), particularly in relation to understanding the role of IT in giving meaning, facilitating power and legitimising actions (Walsham, 2002). The concept of duality of structure contributes to understanding the relations between people and technology use. This is exemplified by Orlikowski's (1992) early use of structuration to represent how people produce and reproduce structures of technology use. According to (Barrett and Walsham 1999), IT can be seen as playing a significant role as a disembedding mechanism which can lead to the separation of space and time leading to a reform of institutional reflexivity.

In general, the integration of structuration in exploring the use of technology and strategic managements has left a noticeable effect on those fields (Zhu 2006). However, Whittington (1992) comments on the under-utilisation of Giddens' works in management studies, stating that "Giddens has still not been fully put into action" (p. 707). This is echoed by Jones and Karsten (2008) who assert that researchers have not yet taken full advantages of Giddens works. They suggest that this is reflected in the over-representation in the literature of Adaptive Structuration Theory which is a specific, constrained version of structuration (De Sanctis and Poole 1994) and by the absence of a tradition of

cumulative studies building on structuration theory. Similarly, Pozzebon and Pinsonneault (2005) claim that empirical studies are still in early stages and the efforts of using structuration have been directed at discussing its concepts without a specific application of those concepts (Whittington 1992).

3.3.1 Challenges of putting Giddens into action

Whilst structuration theory has the powerful features cited above, the literature suggests that the theory does not lend itself easily to implementation. Many scholars highlight the challenges and difficulties associated with adopting structuration theory as a theoretical base in business research. Jones and Karsten (2008) attribute the difficulties in applying structuration theory to its high level of abstraction asserting that it tends to deal with social phenomena in a generic way, avoiding getting into specific details of the context. This degree of abstraction is criticised as inadequate for offering guidance to researchers in empirical settings (Gregson 1989 cited in Jones and Karsten 2008).

Scholars have also remarked on the complexity of structuration theory (Pozzebon and Pinsonneault 2005). It is argued that the complexity of structuration theory arises because it embraces numerous concepts from different areas such as psychoanalysis, phenomenology, ethnomethodology and action theory (Turner and Turner 1991).

As a result of being generic, abstract and complex, structuration theory is claimed to be difficult to couple with a specific research method, thus inhibiting the use of the theory more widely in empirical work (Pozzebon and Pinsonneault 2005). This difficulty is acknowledged by Giddens (1989) where he states that "[s]tructures theory is not intended as a method of research or even as a methodological approach, and its application in empirical research is widely recognised as very difficult" (Giddens 1989: p. 296).

3.3.2 Resolution

The challenges described above have not deterred researchers from using structuration theory to inform their research. The literature suggests several ways to resolve the challenges and difficulties encountered in studying organisation from the structural perspective.

The first suggestion is to use structuration theory as a meta-theory (Weaver and Gioia 1994), guiding other theories and informing organisational research socially. Barrett and Walsham (1999) find the application of structuration theory as a meta-theory in IT research to be influential and powerful for analysing complex data. Second, since structuration includes many different concepts, it is suggested that some concepts may be chosen in a selective way more as 'sensitizing devices than as providing detailed guidelines for research procedure' (Giddens 1989: p. 294). This helps structuration to enrich research

and to "provide an explication of the logic of research into human social activities and cultural products" (Giddens 1991: p. 213).

3.4 Project Management as a Structuration Process

Understanding project work is central to this study in order to develop a better understanding of how project trajectories develop over time. As discussed earlier, the literature cites complexity, embeddedness and learning as key features of the project which, if not managed effectively, lead to project failure. In this study, the project is viewed as a complex and embedded phenomenon driven by learning (Fig 3.2). The project trajectory is traced over time by identifying the challenges facing project members, and examining how members interact with the challenges encountered.

Analysis of the trajectories entails an examination of the relationship between internal project complexity (structural, technical and technological, time-related and organisational), project embeddedness in the wider context, learning, and the emergent project properties and outcomes.

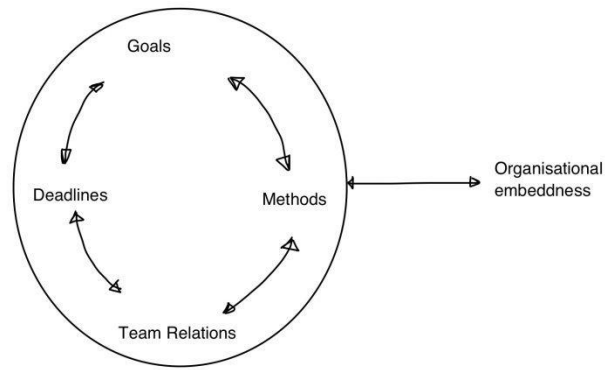


Fig 3.2 Project complexity and embeddedness

3.4.1.1 Structuration Theory as Research Perspective

Structuration theory provides the requisite theoretical and conceptual scaffolding for developing a nuanced account of project work to reveal how project members manage project complexity, embeddedness and learning.

The preceding review of the literature highlights the need for this study to be based on a conceptual and theoretical basis that is suitable for addressing

- a) The social nature of the project phenomenon, elucidating the relationship between project members, project complexity and project context.
- b) The dynamic and recursive nature of project work where the project is defined as a social phenomenon structured across time and space.

- c) The project learning challenges, elucidating the relationship of project members' knowledgeability and challenges associated with the reflexive monitoring process.

The next section summarises the characteristics of structuration theory that make it particularly well-suited for examining these aspects of project work.

3.4.1.1.1 Social nature

Williams et al. (2012) refer project complexity to the social nature of the project. Meanwhile, as Giddens points out, structuration theory is used to "provide an explication of the logic of research into human social activities" (Giddens 1991: p. 213). Particularly relevant to the present study is its utility in explaining the historically problematic and debated relationship between human actions and social structures between individual and society (Pozzebon and Pinsonneault 2005). In this study, structuration is used to understand project activities highlighting the relationships between project members and project complexities as well as between project members and project organisational context.

Framing the relationship between project members and internal project properties and between project members and organisation in terms of structuration theory enables us to capture the duality of structure central to structuration theory (Riley 1983, Jones and Karsten 2008), and understand

project complexities and embeddedness as both medium and outcome of project members' actions.

3.4.1.1.2 Dynamic and recursive nature

Structuration theory focuses on the process-based and dynamic characteristics of social phenomena rather than the static properties. Giddens (1984) introduces structuration theory as a social theory which is interested in the dynamic and recursiveness of the relationship between action and structure in social practices moving the relationship between structure and agents from being a static to a recursive and dynamic process (Pozzebon and Pinsonneault 2005, Jones and Karsten 2008).

Accordingly, in the current study, the complexities of project properties and embeddedness in organisational context are not viewed as being static through the project life cycle. Consequently, the project as a social phenomenon is not seen "as society out there or just the product of the individual here, but as a series of ongoing activities and practices that people carry on, which at the same time reproduce larger institutions" (Giddens and Pierson 1998: p. 76).

3.4.1.1.3 Reflexive monitoring

Projects are dynamic and changing in response to newly available information (Turner and Cochrane 1993). Project members are assumed to be knowledgeable about the surrounding context including the complexities of

project properties and embeddedness in the external context. Project members maintain their knowledge by a process of reflexive monitoring. Reflexive monitoring is a feature of everyday activities where members are involved in a continuous monitoring of the outcomes of their own actions and those of other project and non-project members.

As discussed above, Giddens emphasises the importance of agents' knowledgeability, and cautions that their knowledgeability is not absolute but bounded by unacknowledged pre-conditions. Hence, in the process of reflexive monitoring, actors monitor the outcomes of their actions within the limits of what they are able to apprehend, which may result in unintended consequences as a result of unacknowledged pre-conditions.

In the setting of this study, project members monitor internal project properties (goals, methods, deadlines and team relations) as well as the project relationships with the organisational context. Whilst members monitor project progress in order to avoid any unintended consequences which may lead to project failure, they do so within the constraints of their bounded knowledgeability. The reflexive monitoring process may be hindered by various learning challenges which may be related to team members, absence of organisational support, content type, space and time.

3.4.1.1.4 Social and system integration

Every project member is involved in an individual monitoring process where he monitors his actions as well as the actions of others. Through this individual monitoring, project members maintain their knowledgeability about the internal and external context. Understanding the internal project context involves understanding how project members handle project complexities resulting from goals, methods, deadlines and team relations. Understanding the outer organisational context involves understanding how the project is affected by the surrounding context.

Within the context of co-presence, project members are part of social integration involving "reciprocity of practices including levels of autonomy or dependence" (Giddens 1984: p. 28). Within the project context, social integration happens where project members share their knowledge about existing social structures. Accordingly, it is possible for project members to work together defining project properties and complexities.

On the other hand, as discussed earlier, system integration happens on a systemic level, across extended time and space and in the absence of co-presence. System integration presupposes social integration (Jones and Karsten 2008). Therefore, disembedding mechanisms link project context with organisational context which, according to Barrett and Walsham (1999), are dependent on building new trust systems enabling the individual to be lifted out

from the particularities of the project context to enable institutional reflexivity in the organisational context. Institutional reflexivity may result in new knowledge undermining local practices and project properties.

On the other hand, project members are involved in existential anxiety of an ongoing questioning of new knowledge and practices. Project members question their roles in light of the new knowledge responding to institutional actions in three different modes. First, project members may redefine project properties meeting the new organisational context. Second, they may decide to choose re-appropriation where project members get involved in 'dialectic of control' with the non-project members protecting the project with their knowledgeability of the local project context. Finally, individuals may choose to look for 'empowerment' using their social relations with the outer context to change the newly produced knowledge (see Fig 3.3).

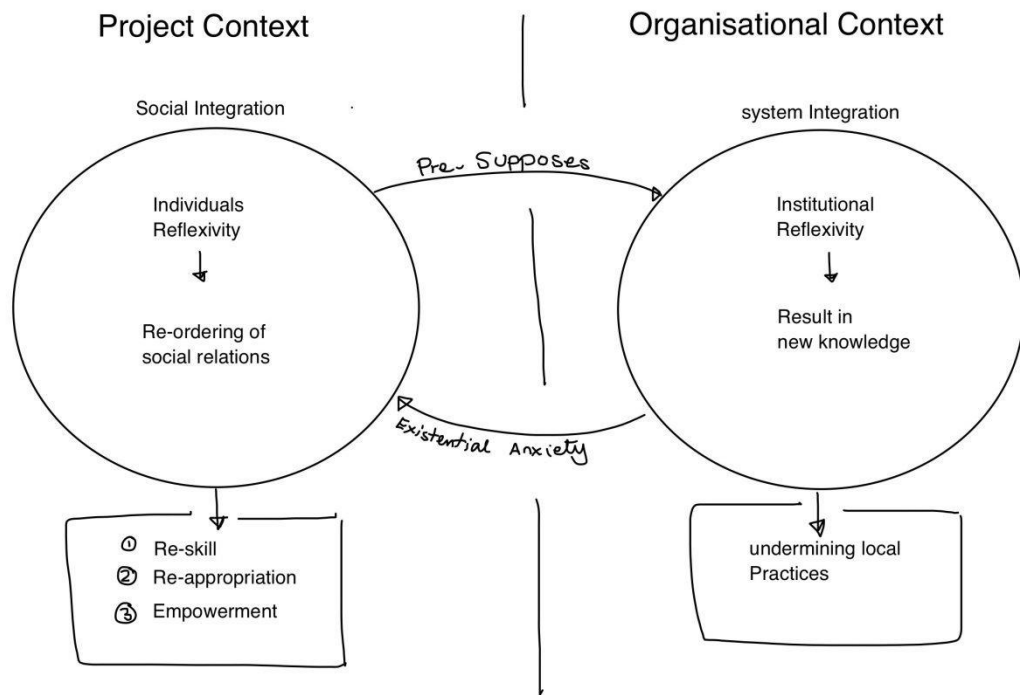


Fig 3.3 Project and organisational contexts integration

Chapter Four: Research Methodology

4 Research Methodology

4.1 Introduction

This study investigates IS project work in the context of Saudi Arabia. The research framework for the study is based on structuration theory, and the field work was conducted using an ethnographic approach. This chapter describes the development of the methodology for addressing the research questions derived from the literature review.

The review of project management literature highlighted the importance of using projects as a way of organising work. Projects were characterised as problematic phenomena suffering from high failure rates (Ciborra and Lanzara 1991, White and Fortune 2002, Marchewka 2006, Kolltveit et al. 2007, Standish Group 1999, 2001, 2004, 2006 cited in Reed and Knight 2010). Project management was viewed as a means of shaping projects to reach a successful end. The review concluded with the articulation of three new project management approaches offering a deeper understanding of the project phenomenon and better guidance for project management. The three approaches were based on three features: project complexity, project embeddedness and project learning. This study proposes that these three features are interlinked and affect each other.

In this study, the project is characterised as a dynamic complex phenomenon embedded in an organisational context and driven by members' learning. The project is viewed as a complex phenomenon where project team members interact with internal project properties namely: goals, methods and deadlines, as well as with external organisational members. These interactions are realised through members' experiences across space and time.

Structuration theory is selected to investigate projects' trajectories across space and time highlighting the social nature of project phenomenon and showing the dynamics of project complexities and how they are shaped by the interactions between project members and organisational context.

This study is interested in elucidating how an IS project in a Saudi organisation is constructed as a result of interactions between project members and project complexities of internal project properties, as well as a result of interactions between project members and other organisational members, learning across time and space. Accordingly, this study examines in detail:

1. How project complexities resulting from project internal properties (goals, method, deadlines and team relations) are constructed over time and space.

2. How the interactions between project team members and surrounding organisational and non-organisational members constructed over time and space.
3. What learning challenges (associated with team members, organisational context, content types, time and space related challenges) confront project members while monitoring project activities.

This chapter presents the research methodology employed in this study to address the research questions. It begins by introducing the philosophical position behind the study and the rationale for selecting the research method, research site and stories. The chapter discusses how the data is collected and analysed, and defines the ethical considerations which have been maintained in this study.

4.2 Epistemological and ontological position

Research philosophy involves sets of philosophical assumptions. Those philosophical assumptions guide the development of the research methodology, starting from choosing the research method, research site and informants, to clearly defining the relationship between the researcher and research data, including how data is collected and how it is analysed.

Philosophical assumptions involve ontological and epistemological assumptions. Ontological assumptions are those views about social realities (Bryman and Bell, 2007) and how the studied phenomena work out there. On the other hand, epistemological assumptions are a set of assumptions describing how researchers can approach and reveal social realities.

Defining a research methodology entails a process of linking research method with underpinning philosophical assumptions. This coherent link between the two helps in producing a rigorous study. Therefore, clear research philosophy involves developing a consistency between the philosophical, ontological and epistemological assumptions and research design.

The studied project phenomenon is treated as a social phenomenon utilising structuration theory to inform the study socially. Structuration theory serves to help the researcher in shaping his ontological and epistemological philosophical positions.

4.2.1 Ontological Assumptions

Mainly, structuration theory is introduced as a development of "an ontological framework for the study of human social activities" (Giddens 1991: p. 201).

Giddens (1984) introduces structuration theory as a social theory, interested in the recursiveness of the relationship between actions and institutions (Giddens

1979, Giddens 1984, Manning 2008). This study synthesises a set of concepts from structuration theory to formulate the ontological position for this study.

Following Giddens' structuration theory (1984), this study moves the relationship between individuals and project features of complexity and embeddedness from a dualism, where there is only one side shaping the other, into a duality where both project features and members are interacting with each other.

"Social structures exist in memory traces" (Ehrenhard 2009: p. 28) consisting of sets of rules and resources. As discussed in the last chapter, these structures have no existence or realities in time and space: they only exist in individuals' heads and are embedded in practices. Individuals in projects are knowledgeable about those rules and resources and this knowledge informs their actions through project lifecycle. This knowledgeability is what makes it possible for project teams to work with each other and with non-project members.

Meantime, project members' knowledgeability with the specific context is not absolute: it is bounded by unacknowledged pre-conditions. Therefore, they are involved in a process of reflexive monitoring where they keep an eye on the outcomes of their actions as well as the outcomes of other members' actions, watching for any unintended consequences. This reflexive monitoring generates new knowledge and adds to project members' experiences about the rules and resources involved in project work.

In this study, projects are divided into two contexts: internal and organisational contexts. The internal context involves project complexities related to project goals, methods, deadlines and team relations. On the other hand, the organisational context involves project embeddedness showing the interactions between project members and non-project members such as end-users, departments, vendors and senior managers. The relationships between project members and internal project complexities and organisational contexts are recursive relationships embedded in daily practices where they are recursively implicated (Giddens 1984). Fig 4.1 illustrates this recursiveness of these relationships where individuals' knowledge of project features is implicated in their actions which are monitored and feed back into individuals' knowledge, informing future actions.

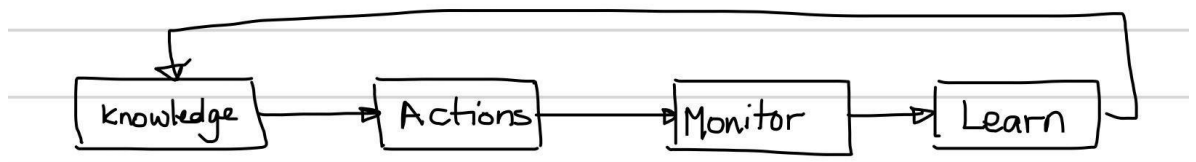


Fig 4.1 Project reflexive monitoring

To reflect more on this ontological view of project work, project members are assumed to be knowledgeable about how project activities are conducted. Project goals, methods, deadlines and team relations are defined. The definition of project properties involves defining project complexity and embeddedness.

Project members continue interacting with each other as well as with non-project members based on those definitions. Meanwhile, they monitor their own and others' actions, trying to avoid any unintended consequences which may lead to changes in definitions of project properties. Consequently, they respond to those changes in different ways. These involve accepting exerted changes and redefining project properties accordingly, possibly engaging in a dialectic of control or seeking empowerment to influence the change.

4.2.2 Epistemological Assumptions

This study works on implementing the strengths of structuration ontology to develop a suitable epistemology. "Research enquiries are contextually oriented" (Giddens 1991: p. 296): this is how Giddens comments on how structuration theory can be implemented in empirical research, adding that a relative autonomy should exist between theory and research, and between abstract concepts or theoretical notions and empirical work. This study responds to this challenge for researchers implementing structuration theory where they are required to deal with the uniqueness of the empirical research context.

Accordingly, the researcher is key in translating the 'theory' into an 'empirical study' where he has "sensitivity to how action is co-ordinated across time and space" (Giddens 1991: p. 294).

Thus closure of the gap between the study and the reality is supposed to be achieved by closing the gap between the researcher and the informant, making

the researcher part of the studied phenomena. Thus the researcher is not independent from what is being researched. The researcher-author describes a setting which he has a 'natural access' to, acting as an active participant, more or less on equal terms with other participants (Alvesson 2003) where the immersion of the researcher in the field is assumed to be highly maintained.

"Reality is grasped through day-to-day praxis" (Giddens 1991: p. 56) where exploring everyday talk and social practices are significant in studying project work. The researcher is assumed to be able to monitor and record people's talks and actions over a long period in daily basis and he is able to describe "how people act, interact, talk and accomplish things" (Alvesson 2003).

Equal to informants, the researcher is assumed to be knowledgeable with shared social structures which govern the transformation in project features. Mainly, informants' actions and talk are given meaning by the researcher who over the course of the study works on articulating the talk and actions. The researcher interacts with the studied group in their local setting over an extended period of time, and is thus enabled to understand their actions and accounts.

However, the researcher's knowledge is not fixed but dynamic, changing where the researcher is involved in a reflexive monitoring process generating, verifying and modifying his understandings. This process occurs in parallel with data collection in the field where the researcher tests and verifies theories (Van

Maanen 1979). Based on Weeks (2000), this iterative analysis and verification process continues until the researcher finds plausible interpretations and workable theories which are capable of explaining all observations.

4.3 Research methods

Ethnography has a very long history dating back to the work of the Greek Herodotus (Sanday 1979). Social science is observed to be increasingly interested in implementing ethnography (Linstead 1993). Bate (1997) defines ethnography "as a particular type of method or fieldwork activity (the "doing" of ethnography), a kind of intellectual effort or paradigm (the "thinking"), and a narrative or rhetorical style (the "writing"). Similarly, Van Maanen (2011) describes ethnography as involving fieldwork, headwork and textwork (. Ethnography is argued to be "art, science, and craft rolled into one" (Bate 1997: p. 1153). This means that the ethnographer artistically captures experiences in the field; scientifically analyses collected data, and introduces the final output as a well-crafted text.

Ethnography is claimed to introduce a closer and deeper representation of social life (Alvesson 2003). According to Bate (1997), ethnography looks to culture as a dynamic concept (in contrast to the notion of a fixed and static corporate culture), and is the only way to study change in social life addressing it in a way no other methodology is capable of doing.

Self-ethnography is a special type of ethnographic study which enhances ethnographic characteristics and benefits, making ethnography more efficient. "A self-ethnography is a study and a text in which the researcher-author describes a cultural setting to which she or he has a 'natural access', is an active participant, more or less on equal terms with other participants" (Alvesson 2003, p. 174). Alvesson (2003) specifies the goal of self-ethnography to be the description of "how people act, interact, talk and accomplish things" (p. 168). Similarly, Anderson (2006) describes self-ethnography as an ethnography where the researcher is a visible full member in the studied group and is interested in producing a theory of broader social phenomena.

Self-ethnography sheds light on one's cultural context beyond highlighting and focusing on his own experience. Self-ethnography as described by Alvesson (2003: p. 176) is "more of a struggle of breaking out from the taken for grantedness" where the ethnographer is a "run-away-researcher" trying to distance himself to generate an account of the experienced social context while the conventional outsider ethnographer is a "burglar-researcher" who tries to get closer to the studied social phenomena.

In addition to the benefits of doing ethnography, Alvesson (2003) recommends self-ethnography for many reasons. First, the researcher is more productive in self-ethnography. Second, self-ethnography is more economical than regular ethnography since the researcher continues doing his usual daily work while he

is in the field which eliminates much of dead-time involved in the doing of conventional ethnography including the familiarisation time. Third, self-ethnography encourages the reflexivity between organisational practices and theories. Fourth, the familiarity of the researcher with the local setting leads to a better development of theoretical accounts well-grounded in daily observations. Fifth, self-ethnography is more capable of recording profound empirical material. Sixth, self-ethnography helps in generating ethnography about elites and higher organisational levels rather than solely targeting lower organisational levels.

4.3.1 Justification of the site selection and selected stories

This study is conducted in a large and mature organisation in Saudi Arabia. It is one of few organisations established right away after the discovery of oil in the country. Since then, the organisation has joined many international organisations regulating the business sector. A few years ago, the organisation began a privatisation process aimed at dividing itself into several business units.

The IT department in the organisation was selected as the research site for this study. Reasons for selecting this site include the long history and central role of the IT in the organisation, the diversity of employees' background in IT and the multiple relations between the IT department, end users, vendors and

contractors, and, above all, the fact that the researcher has a natural access to the department.

The IT department was established in the early 80s. Since those days, IT department has played an important role in the history of the organisation. The IT department was established by acquiring several Information Systems packages from leading organisations working in the same sector in the US and Europe. Over the decades, the IT department has worked on maintaining acquired systems and developing new ones. Furthermore, the IT department was perceived as playing a central role in the organisation's privatisation program where the renovation of IT department was an organisational goal and a change driver.

The IT department has launched various initiatives to adapt the latest technologies. One of those initiatives is to establish a web-application development group (WDG). A diversity of technical training was given to this group. Many applications were developed in-house, accessible from the Internet, serving employees and departments in the whole organisation. The VP IT summarised the role of the IT department in an interview in an international conference recorded on YouTube:

"To [the organisation], IT is a strategic choice. It is a change driver really. We use IT to bring change into the business, make the business more cost-effective,

more efficient, and reduce the time to market... and improve our services and customers satisfaction in the future".

The IT department serves all organisational departments including finance, sales, revenue, human resources and operations. Recently and through the privatisation strategy, the IT department engaged in very close relationships with many vendors, buying new systems to renew its infrastructure and contractors to outsource some of its operations and support services.

In this atmosphere, this study observed three projects. The first project was concerned with implementing a mobile services portal to allow customers to access the organisation's services and products from mobile devices. The second project involved building a security layer to another employee portal project executed by the same project members. The third project was about building an IT correspondence portal as part of turning the organisation into a paperless organisation.

All three projects are connected to the implementation of Portal Systems, and all three projects involved distinctive histories referred to by project members across project lifecycle. However, they were different from each other. The differences included the organisational level of the project manager and his closeness to IT senior managers. Second, the three projects used different communication channels and consequently different knowledge types. Finally,

there were differences in the relationships between project members and non-project members the three projects.

The first and second projects were managed by a system manager who was a first line manager. System managers were normally on salary grade 18 and were selected from senior developers through an assessment process. System managers used to manage project teams of senior and junior developers. In contrast to these two projects, the third project was managed by the VP IT consultant who was a middle level manager reporting directly to VP IT.

The IT building consisted of eight floors. The system manager had an office in the fourth floor while his team members had cubicles just next to his office. On the other hand, the VP consultant's office was in the eighth floor next to the VP office. The differences in location of the teams of the three projects represented a significant difference in their organisational positioning. While the distance between the VP and his consultant was only few steps, the distance between the VP and the system manager was four floors.

The three projects involved different communication channels. In the first project, most communications were conducted verbally. This contrasted strongly with the second project where most communications were done through emails. In the third project, a mix of the two communication types was used.

4.4 Potential limitations of research methods

Despite the ambitious view of ethnography as a solution to many problems in social research espoused by its proponents, the deployment of ethnography is claimed to be difficult and hindered by challenges which make it ineffective in most research purposes (Wolcott 1995). Consequently the researcher concerned with the effectiveness of doing ethnography for a specific research purpose, should be aware of and prepared to identify and overcome its difficulties.

Difficulties facing ethnography involve pressures on the researcher that affect the quality of doing ethnography. According to Alvesson (2003), ethnography is a time-consuming methodology involving the collection a great amount of empirical material making the analysis a very lengthy process. Therefore, most often an ethnographic study loses its thick description quality, turning into a quick description (Wolcott 1995), and long involvement in local settings is replaced by flying visits (Bate 1997). In general, ethnography is claimed to be a stressful job (Alvesson 2003) which in some dramatic views may be seen as risky and have the ability to damage the researcher's career (Wolcott 1995) where the ethnographer is subject to a culture shock because of the extended total involvement in other people's lives and where the experiences gained from total immersion over a long period do not vanish by the end of the

observation period but continue to remain with the researcher leaving him in a state of disorientation (Sanday 1979).

On the other hand, it is almost impossible to mirror reality in text due to its complexity which is represented in all collected data (Alvesson 2003). Alvesson (2003) adds that it is not enough for the researcher to go native reporting details from the field but he is still asked to systematically generate a theory introducing an insight about the studied culture.

Clifford (1986) shows how reality may be subject to distortion in ethnographic studies in different ways. First, contrary to the way culture is presented in the final text as being fixed, culture is changing and emerging. Accordingly, it is impossible to produce an objective ethnography. Second, ethnography is not capable of reporting all members' voices rather it represents few number of voices. Third, informants may not be aware of all events, having only partial and incomplete knowledge. Fourth, informants' knowledge of daily events may not be easily codified and cannot be easily told. Fifth, informants may be still not willing to tell the truth of what really happens. Sixth, informants may be affected by cultural scripts where they tend to represent themselves in some desired ways (Silverman 1993). Finally, informants may be guided by their expectations of what the researcher wants to hear (Silverman 1993).

To overcome these mentioned challenges, a self-ethnography approach is applied in this study where the ethnographer is familiar with the research field

where he worked for a long time before engaging with the field work. The researcher knows much about the history of the organisation and the IT department and is connected with most of the employees through friendship relationships. This familiarity helps the researcher to be close to the meanings of actions and talks, referring to his experience as one of the employees in the field. However, the ethnographer may be distorted by his relationships and involvement in the fields. This is solved first by the fact that the researcher joins the field while he is not an employee in the organisation and he is not involved in competitions over positions. Second, the researcher tends to record all conversations and actions in audio format to have a better position in the analysis stage to make sense of the collected data. The researcher main goal is to answer the research questions. Therefore, to avoid any embarrassment from other informants, he decides to hide the identities of the organisation and all informants. This study draws heavily on the researcher's experiences and knowledge in making sense of informants' actions and talks. The researcher is his own moralist where he honestly report findings away from manipulating data (Norris 1993) influenced by his sincere will to generate enlightening insights about the studied phenomenon.

Self-ethnography as described by Alvesson (2003: p. 176) is "more of a struggle of breaking out from the taken for grantedness" where the ethnographer is a "run-away-researcher" trying to distantiate himself to generate an account of

the lived social context while the conventional outsider ethnographer is a "burglar-researcher" who tries to get closer to the studied social phenomena.

Self-ethnography is neither simple nor without difficulties. As a methodology, it has its own challenges. First, it generates a huge amount of data. Therefore, selectivity is applied to choose very specific data for analysis. Another challenge comes from organisational loyalty where the ethnographer may not expose backstage (Alvesson 2003). To overcome this issue, the organisation identity as well as its business sector is kept anonymous to allow the researcher some flexibility in detailing the selected stories from the field. However, still some details were omitted for ethical considerations.

4.5 Practicalities of doing the research

4.5.1 Data collection

Access to the organisation's IT department had been granted and data collection started on 14th of August 2010 which was the first working day of the month of Ramadan, and continued to the 20th of August 2011.

4.5.2 Access negotiation

Access was granted after a meeting with VP IT and GM Applications Development. VP IT asked GM Applications Development to facilitate the researcher's access and to help him if he needed anything. Right away after the

meeting, GM Applications Development asked the Web 'Development Group's (WDG) system manager to help the researcher to start his fieldwork immediately. It was an easy task to gain access to conduct this study in the organisations' IT department. The WDG system manager welcomed the researcher to join his section allocating him a cubicle with a desk and PC and giving him a quick introduction about current projects.

4.5.3 Data collection method

In the first stage of data collection, the researcher concentrated primarily on becoming familiar with the workplace context, research method and establishing a research routine to overcome the fact that relative to other qualitative research methods ethnography is less planned and has no clear procedures to follow (Bate 1997). Research routine was subjected to an iterative process of revision. Essentially, doing ethnography involves a selection mechanism where the researcher implicitly decides on relevance of events. Choosing a location to be in is - in itself - a way of selecting a set of events to be observed. Such decisions should be justified by theories which enable researchers to avoid the misleading notion "that ethnographic accounts are simply descriptions of reality" (Hammersley 1990: p. 607).

4.5.4 General description of data collection

Data collection entailed two stages. In the first stage, the researcher participated in, and observed two projects in the Web Development Group (WDG). In the second stage, the researcher participated in, and observed a third project in the VP office. The data from this study comprises three stories summarising the trajectories of the three projects.

In WDG, the researcher was working with employees who participated in the same projects and shared similar technical knowledge. They were located in a workplace close to their direct manager. In this stage, the researcher actively participated in, and observed two projects. The first project was initiated by the VP and assigned to the department. It was an implementation of a Mobile Services Portal which would offer services to customers through a mobile channel. The second project complemented another project in the department where WDG had just completed an implementation of an Employee Portal project. As a requirement by the organisation, the security layer of the Employee Portal was supposed to comply with the Single-Sign-On policy. Accordingly a project was initiated by WDG to implement the Portal Security layer.

In parallel to this stage, another period followed, triggered by a request from VP IT Consultant who asked the researcher to join him in a project to design and implement an IT correspondence workflow Portal.

4.5.5 Amount of data

This study covers a full year of observational data over the period from mid of August 2010 to mid of August 2011. This includes around 200 working days of observational data, documents of procedures, manuals and e-mails. Combining diverse types of data is difficult (Arnould and Wallendorf 1994). However, inclusion of various types of data comprising subjective (observation) and objective data (documents) sources enriches the analysis stage (Wolf 1990).

4.5.6 Data storage

In the beginning of this study, the researcher stored data in text format saving them in three locations; laptop local hard disk, flash memory and Goggle Docs. Later, due to the amount of daily data and the lengthy time required for writing those data, the researcher found that it was easier to store those daily notes in Audio format. Those Audio files were stored again in laptop local hard disk and flash memory. This decision was made to allow the researcher to collect more data and have the time to participate with employees in their activities. However, it was accepted that this approach would entail a subsequent period for transcribing those data to text format.

4.5.7 Withdrawal from the field

Due to the level and intensity of participation and engagement, it was difficult to withdraw from the field without coordinating with related key informants. The

researcher defined two conditions that needed to be met before withdrawing. The first was collecting enough data to carry out the analysis phase. This was met when the researcher felt that he had three stories worth telling and analysing. The second condition was to agree on withdrawal with key members from the field.

The researcher discussed his withdrawal with different members to enable them to be ready. At the same time, a promise was given to them that the researcher would do his best to help them remotely from the UK. That was an ethical responsibility on the researcher. Meanwhile, this arrangement gave the researcher the ability to return to the field if that was needed for the study.

4.5.8 Data handling

As stated earlier, collected data involved observational data and documents. Documents were mostly written in English. This covered e-mails, documents, procedures and manuals. On the other hand, conversations and talks were mainly in Arabic. The researcher is an Arabic native speaker and was able to understand the discourse including idioms and common expressions.

Furthermore, the researcher used to work in the organisation, and this made him familiar with the technical and administrative language used in the field.

However, the use of Arabic demanded the two steps of translation and transcription of the data to be represented in the final dissertation. At the same

time, due to the huge amount of data collected over a year of daily attendance and the limited time available for this study, two decisions were taken. First, the researcher elected to only transcribe and translate the three selected stories of the three projects. Second, transcription and translation were merged in one step where the researcher listened to the recordings and wrote down a translated version of the recorded data without passing through a stage of transcribing data into Arabic. During the transcription and translation a *meaning based approach* was applied where the understood meaning of the records was written (Xian, 2008).

The researcher scanned all records and wrote a brief description of the content of each record. Then, he tagged the records identifying the location of the three stories in the recorded files. This helped in extracting the three stories. After deciding on the selection of stories, the researcher commenced to translate and transcribe the three selected stories. Three project stories in text format were produced next to translation and transcription. Those text files were stored in NVivo for further analysis where the stories were coded according to the three project properties (goals, deadlines, methods and team relations), interactions with the surrounding context and learning challenges.

4.6 Data analysis

Data analysis in ethnographic studies does not start after withdrawal from the field and the completion of data collection. Data analysis commences in parallel with data collection. Ethnographers are involved in a process of generating insights out of available data. Generated insights guide ethnographers in the remaining period of data collection. It is a process of verification and re-verification of continuous generated theories until reaching a better theory describing observed phenomena (Weeks 2000).

In self-ethnography, this parallel development of both data collection and data analysis is even more obvious since the ethnographer originally comes from the field. The ethnographer has rich experiences collected in the field prior to the start of the study. Out of those experiences, sociological accounts are built (Giddens 1990).

Data analysis was conducted in three stages. First the three stories were introduced. The stories were recounted by selecting story details directly from field notes in a chronological order. Little alterations to the notes were made to maintain the stories' flows and make them readable. Second, the researcher comments were added next to each story. The purpose of those comments was to link the story details to the theoretical background showing the dynamics of project complexities, the interactions between the project context and the

surrounding context and learning challenges. Finally, an analysis section was added to disembed insights from the stories showing how project complexities, embeddedness and learning are constructed over time and space.

Mainly, data was separated into three parts. Each part was collected from a separate project. Each project had different levels of complexities and different interactions with the surrounding context. Each story was divided based on the changes of its central changing complexity. Accordingly, the first story is divided according to the trajectories of project goals which shape project structural complexity. The second story is divided according to changes to deadlines and time-related complexities and the third story is divided according to changes in team relations and organisational complexity. Project complexities are represented according to differentiation and interdependencies of project properties (Baccarini 1996, Williams 1999 2003).

Each story was further investigated to identify the interactions between project members and between external organisational and non-organisational members. Recorded interactions were examined to identify the external members' interactions which undermined project local contexts, identifying their effects on project complexity. Alongside this, project members' actions were analysed to show how project members responded to undermining actions.

Finally, the three stories were analysed to identify the challenges facing project members while they were monitoring the changes to project complexities and interactions with the surrounding context. Challenges were analysed in five categories in relation to: project members, organisational support, knowledge types, space and time.

4.7 Ethical issues

After gaining an access to the field verbally from VP IT, it was noticed that this access arrangement was not communicated to employees. Only, the GM and EG's system manager was informed and aware that the researcher had returned to conduct a study in the workplace. No announcement was sent to employees to explain the researcher's role, nor was this information communicated verbally. Ethically, the researcher decided to tell all other employees that he was conducting a study in the workplace. The researcher used to know most of employees but they were not familiar with his new role as a researcher. They thought that the researcher had finished his studies abroad and had returned to work. It was an obligation for the researcher to state his role clearly. That was done repeatedly either whenever one of the employees asked about the reasons behind the researcher's return to the IT department or when the researcher met someone for the first time. Subsequently, the researcher reminded employees of his role either in an indirect way or by explicitly stating this.

The researcher assured all employees that he was committed to protecting their anonymity. The researcher would refer to the strict rules of maintaining informants' privacy in his educational institution. Informants showed an understanding of these rules and that that was very much expected. Meanwhile, they were assured that talks were going to be kept safe and would not be shared with anyone else. That might have limited the researcher's chances of verifying the story told by an informant. However, the researcher realised different ways of doing that without revealing the given information.

One of the difficulties facing the researcher, was that no one in the field was interested to know more about the research objective. That was encountered first when the researcher requested the access from the VP. The researcher tried to explain the research objectives but that was interrupted by the VP who assured him that he understood what the researcher was trying to do. Later, similar attitudes were noticed from most employees. They were in the mode that they knew the researcher for a long time and that they were willing to do him a favour regardless of knowing the research objectives or even requesting any protective measures to maintain their privacy or even represent their voices.

Based on the researcher's familiarity with the field, a number of points were noted in relation to this situation. First, few researchers approach the organisation to conduct an academic study and mostly employees do not meet

or communicate directly with them. Mostly, employees receive surveys to be filled and returned. Normally, researchers would approach the organisation through having a personal relationship with one of the employees. Employees never heard about those studies and their findings. Therefore, it is understandable that employees would assume that, at the end, this study would be kept on a university library shelf and not find its way to their practical life. That made them unable to recognise neither any benefits gained from being represented, nor any harm since the study would not be reachable. It was all about doing a favour to the researcher to end his study.

The researcher finds it his responsibility to deliver employees voices. This does not mean, in any way, that the researcher claims his ability to report those voices as they are, but to get as close to them as possible. This closeness happens through immersion. The researcher is there on a daily basis monitoring actions and conversations as they happen in their natural settings. The researcher mostly leaves employees to talk about their chosen subjects, meeting them where they are and when they want.

On the other hand, the researcher is committed to maintain employees' anonymity keeping collected data as safe as possible. The researcher did not use the PC given by the department to store notes or records. The given PC was accessible by network administrators. The researcher recorded notes and talks on a digital recording device and wrote notes on a paper kept in his pocket. At

the end of the day, those notes were saved on the researcher's personal laptop hard disk as well on a USB flash drive and a Google Docs account. The researcher finds it his responsibility to protect employees anonymity during his stay in the field and afterwards. This protection extends to protecting employees privacy where employees shared many personal stories with the researcher which were kept confidential.

In conclusion, researchers are expected to be their own moralists where they honestly report findings away from manipulating data (Norris 1993). The research questions in this study were of great concern to the researcher and sustained the journey to answer them and generate enlightening insights about the studied phenomenon.

Chapter Five: The Saudi Context

5 The Saudi Context

5.1 Introduction

This chapter gives a description of the context of the study. This description is divided into two sections. The first part gives a brief review of management literature relevant to managerial practice in the Saudi Arabian context. This review highlights the discussion in management literature which argues that Saudi Arabian managerial practices in reality contradict ideal values advocated in western managerial practices. Ideal values are imported from western management and Islamic values which give a preference to sharing information and encouraging subordinates participation in decision making. The second part of this chapter gives a brief description of the organisation and the department where the participation observation study was conducted.

5.2 Management practices in Saudi Arabia

Al-Yahya (2009) states that Saudi Arabia is an example of a country that does not command enough attention of researchers in social science or organisational studies. Moreover, El-Sanabary (1993) argues that available studies are subject to some stereotypes, such as studies investigating Saudi women status stress veiling, gender segregation and limited options. These studies fail to address the social changes which vastly and quickly occur in

Saudi Arabia in various areas. Similarly, Al-Yahya (2009) adds that research in the context of Saudi Arabia is characterised by being impressionistic rather than being based on reliable data.

According to El-Sanabary (1993), Saudi Arabia is a conservative and restrictive country. Ali (1993) argues that Islamic and tribal values greatly influence the society. On the other hand, Al-Yahya (2009) states that investment on human resources and education is common in most Arabs countries. He refers to recent organisational development and implementation of new management theories in the region including decentralisation, debureaucratization and knowledge management. El-Sanabary (1993) argues that those changes are due to the sudden wealth following the discovery of oil.

However, Al-Yahya (2009) claims that this investment on development is ineffective and does not result in intended organisational outcomes. That is why he calls for studies to investigate the effect of the factors which influence adoption and effectiveness of those practices in the region.

El-Sanabary's work (1993) is an example of those studies which try to examine and explain changes in Saudi Arabia. She claims that this development is constrained by traditions and religion beside other governmental and organisational policies such as occupational and employment policies. She comments on development and change efforts in Saudi Arabia stating that changes and development unevenly affect economical, but not social,

infrastructures. According to this view, social infrastructure is protected from changes and the change is meant to affect economic structures with no violation to Islamic and traditional structures.

Few management studies identify managerial practices in Saudi organisations (Ali 1993, Badawy 1980, and Al-Yahya 2009). The following sections try to present those practices showing differences among researchers regarding some practices.

Badawy (1980) finds that managers in the Middle East have a low preference for sharing information: they only allow sharing directions and tasks' related information with their subordinates. Moreover, Ali (1993) shows that, due to limited access to information, Arab managers rely on intuition in decision making. Ali (1993) adds that Arabs rely on partial knowledge in making decisions and they view organisational rules and policies as man-made and so to be treated with flexibility.

According to Badawy (1980), this attitude towards not sharing information with subordinates co-exists with disallowing employees to participate in decision making. However, he shows a contradiction in the Saudi workplace where those managers who disallow participation report that the most unsatisfied need in their jobs is autonomy.

Ali (1993) assumes that this participation and similarly consultation are ideal values which are not implemented in workplace. He argues that those ideal values are results of Western management theories, and ideal Islamic and traditional values. At the same time, they are not implemented but managers talk about them to create a feeling of consultation or participation in order to improve their own images.

Ali (1993) presents this contradiction as a contradiction between ideal Islamic and traditional principles emphasising participation which is declared to be implemented with practices which show the demand for obedience and following rulers. Ali (1993) claims that many Arabs experience this dualism, and according to him, this dualism is because of the dominance of coercive force, centralised political system, and quality of political leadership, one of the results of which can be seen in assigning relatives and clan members to senior positions in organisations and in governments. Ali (1993) gives an example of the Saudi government who stresses strict implementation of Islamic principles although those principles do not fit with a kingdom system of absolute monarchy. Ali (1993) reflects his proposed dualism on management practices stating that Arabs managers control and manipulate the workplace environment to control employees.

Ali's explanation (1993) matches Hofstede's findings (reported in Newman and Nollen, 1996) that Saudi Arabia is a high power distance country. Newman and

Nollen (1996) state that encouragement of participation is interpreted as a weakness in Saudi Arabia.

Almaney (1981) and Baali and Wardi (1981) (both of them are cited in Ali (1993)) claim that Arabs are highly individualistic. Ali (1993) rejects such a claim stressing the importance of understanding the meaning of individualism in Arab society where individualism does not refer to privacy or autonomy but refers to moving from one's primary group and joining another powerful group (e.g. extended family, tribe, religious, regional and communal group).

According to Badawy (1980), there are some differences between western and Mideastern managers' needs due to cultural differences. First, Middle easterners are authoritarian. Second, differences in communication exist where Arabs emphasise personal communication, preferring communicating with familiar faces. This is confirmed by Ali (1993) who shows that Arabs pay great attention to emotions and feelings which make them tend to reach a win-win negotiation and adds that the most important issue is trust and adapting basic cultural awareness, with more emphasis non-verbal contacts and body language such as eye contacts, and less on procedures. Third, a holistic view is applied by Arab managers causing a delay in doing business and taking decisions (Badawy 1980). Confirming this, Ali (1993) states that Arabs consider a solution to come from consideration of all issues. Fourth, time and space concepts differ between the two cultures. Time is not conceptualised by Arabs managers who deal with

it as an open-ended concept, similarly, space is considered as public allowing business to be conducted everywhere (Badawy 1980).

Al-Yahya (2009) reviews previous studies identifying trends suggesting that organisations prefer the use of consultation and other trends suggesting that organisations prefer directive management practices. Al-Yahya (2009) explains that those differences are due to historical changes where the directive management practices were identified in a few studies published in 1980s. In his study, Al-Yahya (2009) finds that 60% of respondents prefer participation in workplace which he refers to a change in attitudes towards new and international management practices. Al-Yahya (2009) suggests that some managerial practice shifts are identified in Saudi Arabia and improvements are identified especially in preferring participation more than only consultative attitudes.

In conclusion, the literature suggests different views regarding the cultural factors influencing managerial practices in Saudi Arabia. Scholars' views vary from those who consider Saudi Arabia to be a high power distance country where managers are authoritarian to those who assume that this historical view has changed and Arab more recently managers prefer participation to directing. In the middle, there is a view stating that this is due to a dualism in the workplace where what is declared (participation) is different from what is implemented (directive). This calls for more in-depth studies in Saudi Arabia

(Ali 1993, Al-Yahya 2009) other than impressionistic and stereotyped studies.

Ali (1993) argues that correlation studies are not able to examine contradictions which exist in Arab culture and he calls for high quality observational studies. At the same time, Al-Yahya (2009) recommends longitudinal studies to confirm and examine social changes in the context of Saudi organisations.

5.3 Organisation and IT department background

This study has been conducted in a Saudi organisation. The organisation was launched in the mid-40s by the founder of Saudi Arabia, King Abdul Aziz. Later in the early 60s, a Royal Decree signed by King Faisal has changed the organisation into an autonomous corporation run by a Board of Directors and chaired by one of the government Ministers. By mid-60s, the organisation joined regional and international agreements and organisations regulating its business sector. The organisation is one of the large organisations in Saudi Arabia employing more than 33000 employees and has around 150 domestic offices and 100 international offices.

The organisation has many departments. One of them is the IT department where the participation and observation for this study was conducted. The IT department was established in the early 80s when the building, where the study took place, was built. Since those days, IT has played an important role in the

history of the organisation. The IT department has been established by acquiring several IS packages from leading organisations working in the same sector from the US and Europe. Over a long time, the IT department has worked on maintaining the acquired systems and developing new ones satisfying end-users needs and requirements.

Meanwhile, since the start of the new millennium, the IT department has launched various initiatives to adapt the latest technologies. One of those initiatives was the establishment of a Web-application Development Group (WDG). A diversity of technical training courses were given to this group's members. Later, many web applications were developed in-house offering services accessible from the local intranet and Internet serving employees and different organisational departments.

The privatisation program arrived in the mid- 2000s. According to this program, the organisation is divided into Strategic Business Units prior to transferring those SBUs into separate companies. The IT department has been considered to play a pivotal role in preparing the organisation for privatisation rendering the organisation more effective and attractive for investors. The IT department was involved in a modernisation plan renovating all its IS services and systems. The VP IT said in an interview in an international conference which is recorded on YouTube "to [the organisation], IT is a strategic choice. It is a change driver really. We use IT to bring change into the business, make the

business more cost-effective, more efficient, and reduce the time to market ... and improve our services and customers satisfaction in the future".

The IT department serves all organisational departments including finance, sales, revenue, Human resources, operations, etc. It is approached by different organisational management levels. Recently and according to the privatisation strategy, the IT department has been engaged in very close relationships with many vendors. It has been involved in buying new systems to renew its infrastructure. At the same time, the IT department has signed with contractors to outsource some of its operations and support services.

The IT department has been given the role of evaluating and purchasing new systems which adapt best practices. Meanwhile, the it was also given the role of guiding the implementation of those new systems including offering a first line support prior to contacting vendors as well as training end users and helping them to incorporate new business rules and best practices into their business processes. The IT department has initiated 18 initiatives as part of an IT master plan. That master plan has been allocated a budget of half a billion dollars over three years. Many projects were kicked off based on these directions. Projects were dependent on each other and geared towards making an organisational change.

Since its establishment in the early 80s, the IT department has sent many Saudi high school graduates to the Republic of Ireland and then to the US for training

as software developers. When they returned to the organisation they were working with the expatriates from around the world who were given offers to work in the IT department. This process continued for a decade from early 80s to early 90s. Later, IT was hiring fresh university graduates and they were given in-house training. Currently, the IT department has more than 600 employees, some employees are from the first group who were sent to Ireland and the US and some are from the freshly graduated group.

Fig. 5.1 shows the organisational structure of the IT department. The IT department is headed by a VP who is directly reporting to the organisation. The IT is divided into 6 cost centres and each cost centres is managed by a General Manager (GM). Each cost centres is divided into different areas where each area is managed by an IT manager. The applications development areas are divided into different sections and each section is concerned with the maintenance a specific system serving numbers of end-users' departments. Sections are managed by system managers where each system manager manages number of senior and junior developers.

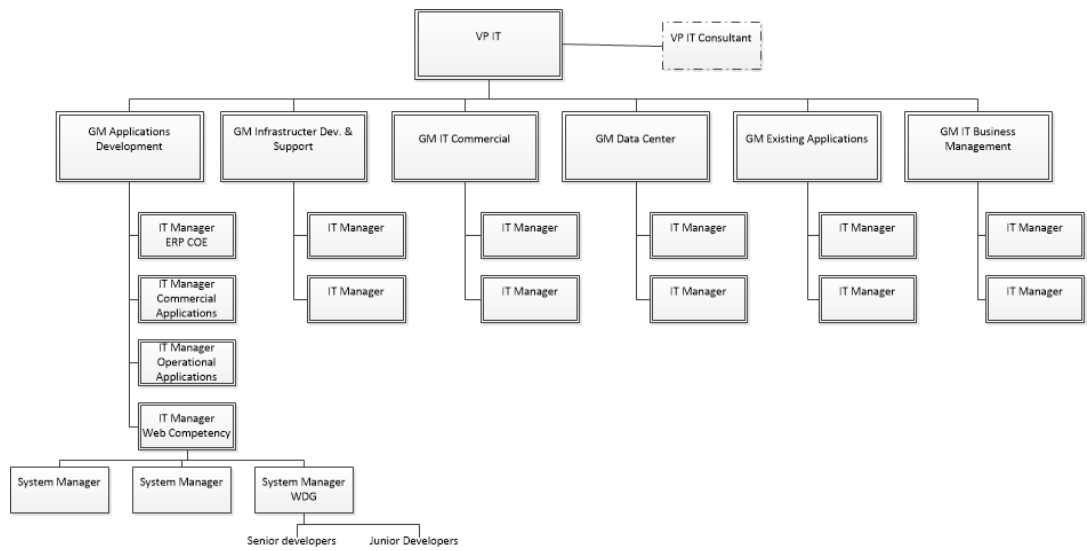


Fig 5.1 IT Organisational Structure

Chapter Six: The Mobile Services Project

6 The Mobile Services Project

6.1 Introduction

This chapter describes and analyses the Mobile Services Project. The project involved the development of a set of services ready to be accessed through customers' mobile devices. Similar services were available to customers through the desktop version. The existing services were developed by a business vendor (bus-vendor) for the end-user department. Old services were designed and implemented through direct communication between the end-users and the bus-vendor away from IT Dept involvement.

This chapter is divided into three parts. The first part introduces a project timeline. The second part describes project complexity and the surrounding non-project context. Finally, the third part uses structuration theory to understand project activities across time and space.

The first part presents the story of the Mobile Services Project. The story is presented in a chronological order. The story illustrates project activities from initiation to termination highlighting the main events occurring during project lifecycle.

The second part highlights the challenges facing the project due to internal project complexities and external surrounding context. First, it explains project

complexity illustrating the four types of complexities: time-related, technical and technological, organisational and structural complexities. Second, it shows the relation between the project context and the surrounding external non-project context describing the *pre-project partnering* between project members and end-users. It also introduces the relationship between end-users and external vendors ending by highlighting how IT senior managers shaped that relationship and consequently shaped the relationship between project members and end-users.

Finally, the third part gives a structurational analysis to project activities. First, it highlights the structuration of project complexities showing the changes in project complexities over project lifecycle and showing the relations between different types of project complexities. Secondly, the analysis shows how the external context had played a role in undermining internal project context and how project members had responded to those undermining actions referring to the three modes of re-skilling, re-appropriation and empowerment. Finally, the analysis shows the challenges which affected project members' monitoring of project activities. Those challenges are categorised into five categories: team members, organisational, content-type, spatial and time-related challenges.

6.2 First Part: Project Timeline

The organisation was running a privatisation program. Part of that program was the improvement of the organisational IT services.

One of the IT project managers was promoted and appointed as an acting VP IT. Prior to the appointment of the new VP, end-users had the power to skip IT Dept's role and communicate directly with external vendors. IT Dept used to develop products and services, however, end-users had the power to ignore those products and services and purchase similar products from external vendors.

Prior to the project, the end-users had worked directly with the vendor (bus-vendor) requesting the development of different systems. The organisation's main website was a result of such a direct relationship between the end-user and the bus-vendor.

6.2.1 Project Initiation

The project had started when the VP asked the system manager of Web Development Group (WDG) to join a business trip to meet the bus-vendor. The time and the place of the trip, which was right away after Hajj holiday and at the bus-vendor's location in Nice, were decided by The VP.

The scope of the project was not made clear to the project team members at the onset of the business trip. In their first meeting with the VP, the project members were told that they need to go in a business trip to see the Bus-vendor's mobile services. Later, in another meeting, right before the trip, the VP told the project manager that WDG was expected to build mobile services on top of IT old assets. Meanwhile, the VP stated explicitly to project members that the organisation had an agreement with the bus-vendor enabling the IT Dept to utilise all the bus-vendor's web services for free. However, the project team did not know about that agreement and they went for the trip without knowing exactly what they were entitled to have from the bus-vendor.

6.2.2 Business trip to Nice

The project manager and the senior developer returned from the business trip disappointed. The bus-vendor did not have enough information about the project team's role. The bus-vendor was only familiar with the end-users who were the ones who used to make agreements and buy new products.

The project team members assumed that their relationship with the bus-vendor was affected by the past relationship between the Bus-vendor and the end-users. The bus-vendor was only considering selling products to the organisation and not considering the integration between the two systems.

The bus-vendor had not listened to the project team. The bus-vendor representatives were not ready to discuss technical issues as they were only salesmen. In fact, a Tunisian employee from the bus-vendor told the project team privately that bus-vendor's representatives did not want to take any commission for those offerings and all what they want to do was to help the project team. Moreover, the bus-vendor warned the team that getting involved in in-house development would be a nightmare.

The team's impression about the bus-vendor was very poor, they even claimed that the bus-vendor was trying to offer them a bribe for recommending their products which is considered to be a very serious religious sin in Islam.

The bus-vendor told the project team that they would release enquiring mobile services in April 2011 and sales mobile services in mid-2011. At the time of the trip, the bus-vendor was in the process of selecting an outsourcing company to implement mobile services.

6.2.3 After the business trip

After the return from the business trip, the project manager did not manage to meet the VP or the GM because the project team came back on Friday and senior managers left on the same day just few hours after the project team's arrival. The VP and the GM left to meet the bus-vendor's senior management on the following Tuesday and Wednesday.

However, the project manager had briefed them by an e-mail. The project manager expressed the team's disappointment with the business trip and the bus-vendor. Later on the same day, the GM phoned the project manager to get more clarification and details about the business trip. At the same time, the VP sent an email to the bus-vendor expressing his disappointment for the way they dealt with the project team.

6.2.4 Project Execution

The project manager had defined the project goal according to the VP's vision which involved building mobile services allowing customers to access all organisations' services from their mobiles.

The project deadline was set to be the end of the second quarter of 2011. That deadline was decided based on the bus-vendor expected mobile services release date. The VP told the project manager that he would wait for the Bus-Vendor's services till that date. However, if the project team could be ready with their services before that time, the VP would take the in-house solution instead of the bus-vendor's solution.

The project manager found the business vendor slow which could favour the chances of his team to complete the project before the deadline. This was assumed to help winning the VP's support.

The project team did not reach an agreement on the development methodology to be used to implement the project goals. The project manager was in favour of using Mobile Portal Technology while the senior developer thought that technology could be problematic if used in that project. The Mobile Portal Technology was bought in 2004 but had not used since its purchase. The project members had received some training sessions on using Mobile Portal but they had never implemented any project using that technology. Also, the Mobile Portal environment was not yet ready. The Mobile Portal technology was planned to be used as part of another project but it was eliminated from that project because of the limited time available. The project manager looked to Mobile Portal as one of the assets owned by the IT Dept but not utilised yet.

Although the project manager assumed that the project had the enough time to allow project members to build their experiences in using Mobile Portal, the Senior Developer was reluctant to use Mobile Portal development methodology. The senior developer found it difficult to compete with the bus-vendor using Mobile Portal technology. Alternatively, he preferred to use the existing Web development methodology which had been used in all past projects.

Part of the senior developer's view of the project was to obtain privileged access which would have enabled the authority to 'Add' and 'Change' records in the bus-vendor system. At the same time, the senior developer needed to have end-

user's support to help the project members' understanding of the business rules of the bus-vendor's system.

The project manager preferred to split the project into two phases. In the first phase, an initial product was planned to be introduced to show the project team's capabilities and to gain senior management support. This support was expected to help in the second phase of the project. The slow progress of the bus-vendor's approach was assumed to be helpful. This was thought to allow the project team to build their expertise in using the Mobile Portal.

The first phase was expected to be mainly informative. Delivering the informative services as a first phase of the solution could be very rewarding and help gain the senior management support for the full mobile services.

The project manager found that neither the privileged access nor the end-users' support was necessary in the first phase of the project where only informative services were intended to be implemented. Consequently, the project manager did not contact IT senior management to ask for privileged access and did not contact end-users to ask for their support in the business rules. The project manager delayed the senior developer's request for the second phase of the project.

Before the conflict between the senior developer and the project manager came to a head, the senior developer moved to achieve his goals. The senior

developer bypassed the project manager and approached the GM to request privileged access. However, his request was rejected.

Following the rejection of the request, the project manager sent the Senior Developer on a training course for two days. The project manager wanted to use those two days to re-organise the project. During the absence of the senior developer, a junior developer suggested splitting the system into two parts. One part was to use in the background the product developed by the Senior Developer using the old Web development methodology and the second part forming the user interface was developed by the junior developer using Mobile Portal Technology. The Junior Developer suggestion entailed that Mobile Portal technology to be only used as a user interface and not to be integrated with business rules which would be left to the background system. The project manager found this solution to be suitable for the project.

6.2.5 Project Termination

Later, The VP asked the project manager to communicate with the end-users and work with them on implementing mobile services. The end-users had contacted many external vendors to deliver the mobile solution. The VP expressed his interest in IT Dept involvement in the solution. The VP told the project manager that, at the end, it would be up to the IT Dept to choose to buy or create the mobile services.

The VP redirected an end-user invitation to the project manager to attend a meeting with them. A document was attached to the invitation. The document described the end-user's specifications of the mobile services. The end users' document was prioritised into three phases. Each phase contained a set of mobile services.

The project manager reviewed the document and found that some of the services which were delayed to the second or the third phase could be delivered immediately by his team.

The project manager knew the end users since they were using some of his department's SMS services. However, the end-users did not know about all the available mobile services since some of the services were only developed for executives based on the GM request.

The project team attended the meeting to see what the end-users wanted where the project team was asked to work with them. Concurrently, the project manager would try to sell the team's mobile services to end-users.

In the meeting, the project team realised that the end-users had been working on the subject even prior to the start of the IT Dept efforts. The project team were surprised by discovering many activities done by the end-users which they did not know about. They did not know that the end-users had been working on the mobile services issue for a long time, and those efforts were

translated into establishing an area with a manager to look after mobile services.

The end-user mobile services were discussed with three mobile services vendors. Not all offerings were shared with the project team. The project manager was interested in understanding the end-users requirement and to link them with the services which they were able to develop.

The meeting with the end-users allowed the project team to discuss the mobile services specifications with the end-users and to inform the end-users about their expertise in developing mobile services. One of those services was an iPhone application which was developed by the project team previously. The end users goals included the development of an iPhone application. Therefore, the two parties agreed on enhancing the old iPhone application and to use direct calls instead of SMSs.

Out of the old project goals and methods, the team agreed to implement the method to use except that instead of using Mobile Portal technology they were going to use iPhone development methodology. The junior developer would work in modifying the iPhone application and the Senior Developer would develop the business code in the background using the old web development methodology.

The project team managed to finalise the iPhone application in time.

Afterwards, the project manager stated that he would be waiting for any other requirements from end-users or IT senior management. The project was assumed to be completed but the project team members were under the impression that IT senior management had lost that battle with the end-users.

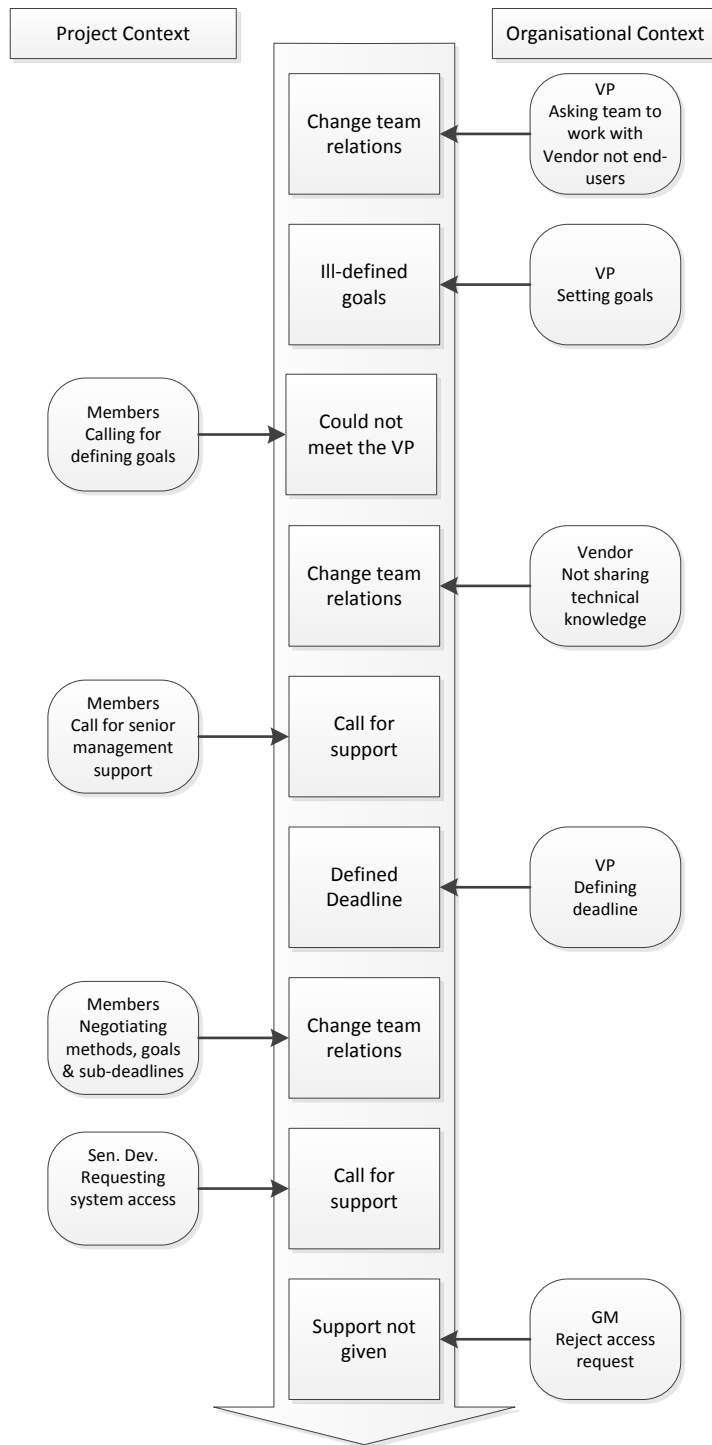


Fig 6.1 Mobile services project timeline (Part 1)

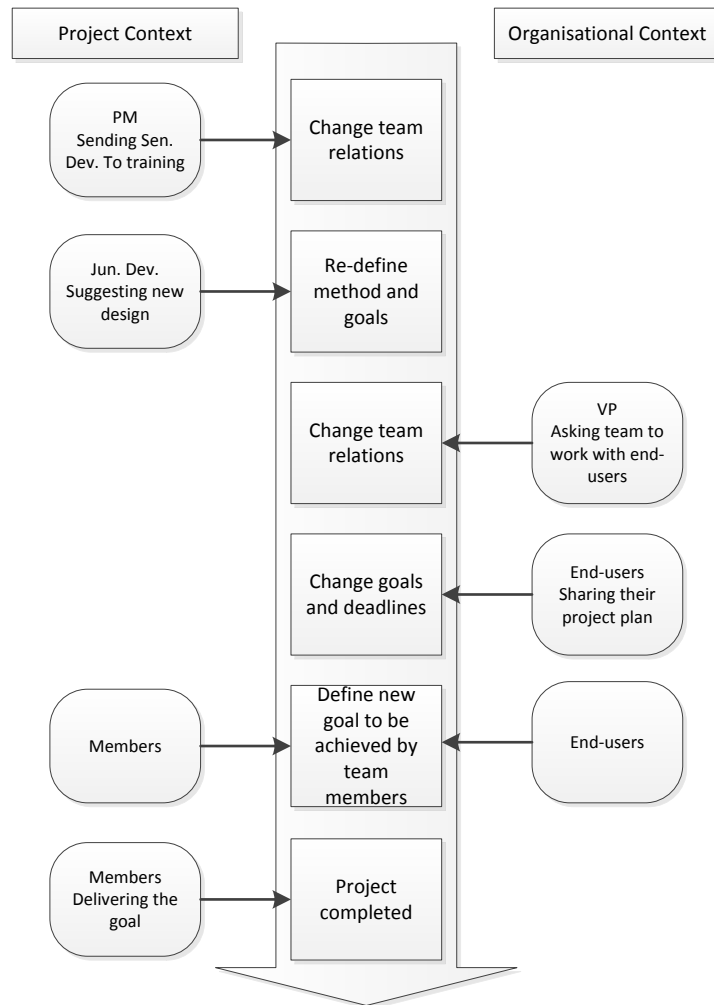


Fig 6.2 Mobile services project timeline (Part 2)

6.3 Second Part: Project Complexity and Surrounding Context Challenges

6.3.1 Project Complexity

6.3.1.1 Time-related complexity

Project time-related complexity is assumed to be a result of deadlines uncertainties, changes in deadlines (Manning 2008) or committing to tight deadlines (Williams 1995, 2003). Due to competition and the tendency to reduce time to market, time-related complexities are assumed to be increasing (Williams 1999).

In the mobile services project, the project deadline was clearly defined to be by the end of the second quarter of 2011. That deadline was clearly set by the VP. The whole project team knew and were agreed on the overall project deadline.

The deadline was set based on the deadline of another external project. During the senior management business trip to Nice, they realised that the bus-vendor would release their final mobile services solution by the end of the second quarter. Therefore, the project deadline was set to compete with the bus-vendor deadline.

***"Project Manager:** The VP said that he will wait for the bus-vendor who will be ready by the second*

quarter of 2011. If we will be ready before them, the VP will take our mobile solution".

The project deadline was considered to be part of the project boundaries which were not expected to be exceeded. At the same time, meeting the deadline was seen as one of the project success criteria which senior management would require projects to meet. The VP stated that meeting the project deadline would let him take the project team's solution instead of the bus-vendor solution.

Setting the project deadline to compete with the bus-vendor deadline was not considered to be tight and did not impose any time pressure on the project.

***"Project Manager:** The bus-vendor is slow which can help us to introduce something. This can help us to win the senior management support ... Thus; we can first build informative mobile services which can be very rich."*

In summary, the project included a well-defined deadline. The deadline was affected by the surrounding competition but it was a 'relaxed' deadline and was not putting time pressure on the project. Consequently, the deadline was not adding to the project complexity.

6.3.1.2 Technical and technological complexity

Technical and technological complexity is assumed to be a result of the applied project method. Technical and technological complexities increase due to the uncertainty of the applied method (Williams 1999, Turner and Cochrane 1993),

the increase in the number of the tasks (Jones 1997) or the number of inputs to tasks (Baccarini 1996), the increase in the number of specialities required in the applied tasks and the interdependencies between applied tasks and inputs (Baccarini 1996, Jones 1997).

In the mobile services project, the project had two development methodologies to choose from. The two available methodologies were the existing Web development methodology which was used in all past projects and a newly introduced Mobile Portal development methodology.

The senior developer preferred to build the required mobile solution using the existing development methodology.

*"**Senior Developer:** But, I have a problem with Mobile Portal technology. It is not ready yet and we cannot compete with the bus-vendor using Mobile Portal. If you [project manager] want mobile services using our regular development way then yes we can have a product before the bus-vendor."*

The senior developer did not find the Mobile Portal development methodology to be clear and well-defined. The new Mobile Portal development methodology was assumed to suffer from uncertainty. Method uncertainty is assumed to add to the technical and technological complexities (Turner and Cochrane 1993). Therefore, using the old development methodology was seen to protect the project from increasing project complexity.

On the other hand, the project manager did not want to avoid considering the use of Mobile Portal technology.

*"**Project Manager:** We don't want to be slaves of the technology [referring to current development methodology]. If you can do them [mobile services] using this technology [Mobile Portal] so why not to use it?"*

Consequently, the project team was faced with the choice of using Mobile Portal development methodology, hence increasing project complexity or to using the old Web development methodology and so reducing project complexity.

6.3.1.3 Organisational complexity

Organisational complexity is assumed to reflect the complexity in project team relations (Baccarini 1996). Organisational complexity increases due to the increase in project members and groups and the interdependencies between project members (Lindkvist et al. 1998). Vertical differentiation complexity is a result of the number of units and departments participating in the project while horizontal differentiation is a result of the depth of the hierarchy (Baccarini 1996).

In the Mobile Services project, the project team consisted of the project manager, a senior developer and number of junior developers. All project members were from the same department and all of them were web application

developers. At the same time, all developers were reporting to the project manager in a simple hierarchy.

The project was observed to be unaffected by organisational complexity as project team members were working in the same department next to each other thus minimizing the organisational complexity associated with vertical differentiation. All project team members reported directly to the project manager minimising organisational complexity due to horizontal differentiation.

6.3.1.4 Structural complexity

Finally, structural complexity is assumed to reflect the complexity in project goals (Williams 1999). Structural complexity is assumed to be due to ill-defined goals (White and Fortune 2002, Dvir et al. 2003) and increases as a result of the increase in the number of goals and the increase in the interdependencies between project goals (Baccarini 1996). Projects could become more complex due to an increasing number of personal goals added by participating project members or groups (Briner and Geddes 1990, Kliem and Ludin 1995 cited in Gray 2001).

6.3.1.4.1 Ill-defined goals

The project started with two goals. The two goals of the project were to 'develop Mobile services' and to 'build them upon existing old assets'. Those two

goals were associated with the IT Dept VP. The goals were obtained from the VP's conversation with the project team members when they had two quick meetings with him prior to the business trip. Those goals were too broad and not detailed.

"Project Manager: *The VP wants to allow customers to be able to access our services through mobile devices."*

Project ill-defined goals were assumed to increase project structural complexity (Williams 1999). Project team members had difficulties dealing with project structural complexity handling ill-defined goals. They were asking the project manager to meet the VP to get more clarification about those goals. The project manager tried to meet the VP and the GM many times but he could not. Accordingly, the project members did not find a way to detail the project goals. Finally, they were called to meet the VP who gave more details about the project.

"Project Manager: *In conclusion, we did not understand the purpose of the trip until we met the VP who said clearly that we have agreements with the Bus-Vendor. The VP told us that we are entitled to have all the Bus-Vendor's web services for free. The VP wants us to build on top of our existing assets. Let's use their web services and make our front end."*

Project goals were only then better defined. The project goals were understood to be the integration with the bus-vendor's product and the development of a mobile user-interface which was able to offer bus-vendor's web services to

customers through mobile devices. This goal was facilitated by knowing that the IT Dept had an agreement with the bus-vendor to consume their web services for free.

6.3.1.4.2 Personal goals

The project involved other goals. One goal was inserted by the senior developer while the second goal was inserted by the project manager.

First, the senior developer found the project as an opportunity to gain an access to old resources which were denied from the department in previous projects. The senior developer wanted to request a privileged access with the authority to make modifications to customer database rather than only having a display access.

***"Senior Developer:** We need an access with the right privileges to execute those services. We need to have an access with ADD and CHANGE privileges".*

This access was requested before from senior management but it was not granted because there was no business case to justify that request. The senior developer found the project offering a good chance to obtain that access.

***"Senior Developer:** It's our chance to ask for such an access. Before, I talked with the VP about having this access and he said that there is no problem and redirected me to contact the IT-Bus manager. IT-Bus manager redirected me back to the VP saying that I need to talk to The VP. Later, the VP told me that we can have this access if we have a business case".*

On the other hand, the project manager saw the project as a chance to implement Mobile Portal Technology. The project manager did not want to avoid using the Mobile Portal technology in the project.

*"**Project Manager:** We don't want to be slaves of the technology [referring to current development methodology]. If you can do them [mobile services] using this technology [Mobile Portal] so why not to use it?"*

Mobile Portal technology was bought since 2004 but was not used since its purchase. Mobile Portal was planned to be implemented as part of another project when it was taken out from that project because of the limited time available. The project manager looked to Mobile Portal as one of the assets owned by the IT Dept which they needed to build with.

In summary, the project structural complexity increased due to ill-defined project goals and the multiple personal goals inserted in the project by the project manager and the senior developer.

6.3.2 Interactions with Organisational Context

6.3.2.1 Relationship with end-users

The relationship between projects and end-users has been given special attention in project management literature where projects are assumed to fail due to user-related risks (Jiang et al. 2002). At the end, project outcomes should meet users' expectations (Avots 1984). Accordingly, project members should

work on closing the gap between users' expectations and internal project goals (Jiang et al. 2002). This is expected to be achieved through building strong relationships and being engaged in "Pre-project partnering" (Larson 1997) which is seen to be helpful rather than simple handshaking in the project initiation phase (Jiang et al. 2002).

In the organisation studied, the project team members had been in a continuous relationship with the end-users. They had worked together in many previous projects. That shaped the relationship between the two sides over time.

Maintaining the relationship with the end-users was central to the IT department. The IT Dept was considered to be in partnership with end-users to achieve organisational goals. This was clearly stated in the IT mission statement:

"To work in partnership with all divisions to achieve [the organisation] vision and goals through the effective application of Information Technology".

6.3.2.1.1 Why were the end users needed?

To understand the relationship between project members and end-users, it is essential to pay close attention to what would project members need from the end-users and what would the end-users expect to gain from their relationship with the project members.

6.3.2.1.1.1 End-users experiences in business rules

The relationship with end-users was important in development projects since end-users were experienced in business rules which project members needed during project requirements gathering phase and even later during implementation and testing phases. Therefore, during project lifecycle, communications were highly focused on collecting business rules.

6.3.2.1.1.2 Access to other systems

At the same time, end-users enabled access to other systems which were not developed in-house. End-users had an access to functions and data from those systems.

The relationship with end-users enabled easier access to learning those systems rather than requesting access through a lengthy formal process of seeking senior management approval and then spending time to build experience in those systems.

End-users helped in accessing those systems, building up project members' experiences and enabling them to be ready to integrate with those systems.

6.3.2.1.1.3 Access to post-project support

For the end-users, the relationship with project members was used to maintain good access to support where project members used to respond to end-users'

requests away from the official procedure of raising a change request and being delayed by the process.

Project members knew the role which the end-users could play in the project.

At the same time, they knew what the end-users requirements were. The relationship was not only limited to a specific project. The relationship was continuous and developing from one project to another. Project members maintained access to business rules and other systems functions and data. Similarly, end-users had quicker and easier access to IT support.

The relationship was maintained through extensive "pre-project partnering". This partnership was maintained over time and from one project to another. This partnership was not formal. It was a reciprocal relationship that enabled both parties to bypass the delay and complexity of formal relationships. The project team members had unofficial access to systems developed by other vendors and end-users managed to skip the formal process of raising support requests.

6.3.2.2 Relationship with vendor

The project members were not familiar with the bus-vendor. They had only communicated with them once before the mobile services project. Previously, the project members were involved in a project (Staff Application) which required technical integration and support with the bus-vendor.

***"Project Manager:** They [bus-vendor] sent us the needed parameters and a document to use. But these parameters are changing ... We were communicating with Yousif from the Bus-vendor. He was slow and was taking a long time to come back."*

That was how the project manager described their past communications with the bus-vendor. The project manager found the relationship of exchanging documents describing the required parameters to implement them as unsatisfactory. The documents were perceived to be unable to address the dynamics of the changes in IS development projects. Web services parameters were perceived to be changing from time to time. Moreover, during the development and testing of those web services, project team used to encounter problems and difficulties which required interactions with the bus-vendor to help in overcoming them.

6.3.2.2.1 Using organisational support to communicate with the vendor

The project manager assumed that IT-bus (another department in the IT) was closer to the bus-vendor. IT-bus was in regular contact with the bus-vendor support team. This support was mainly concerned with supporting the organisation's end users who directly used the bus-vendor systems. IT-Bus showed cooperation with the project team helping them to reach some help and receive some answers to technical problems. Through maintaining a good relationship with IT-Bus, the project team had managed to build their relationship with a bus-vendor support team member.

6.3.2.2.2 E-mail relationship with bus-vendor

Through the help of the IT-Bus, the project team members had managed to build a relationship with one of the bus-vendor support team. This relationship enabled the previous project team to overcome some of the encountered technical problems.

However this relationship was not perceived as an efficient relationship. Information was communicated over e-mails and was hindered by delays in response.

In contrast with the strong and historical relationship between the project team and the end-users, the relationship with the bus-vendor was limited and did not establish a 'pre-project partnering' between the two parties.

6.3.2.3 Relationship between end-users and the vendor

Through the continuous relationship between project members and end-users, project members could witness the strong relationship between end-users and external vendors. The relationship was obvious and monitored by all IT Dept members. That relationship was perceived as a sign of IT Dept weaknesses. The IT Dept was seen as being weak because end-users had the power to skip IT Dept role and to communicate directly with external vendors. IT Dept used to develop products and services. However, end-users had the power to ignore those products and services and go to buy similar ones from external vendors.

Many stories were told by IT Dept employees describing purchased systems where project members could develop or had already developed better solutions. Previously, end users would work directly with external vendors requesting the development of new systems. This relationship used to be exercised away from the IT Dept, where the IT Dept used not to be aware of the details of those interactions and consequently not consulted in the agreements or contracts signed by the two parties.

This created a threat to IT department's projects where they were not always accepted by end-users who might prefer to purchase similar products from external vendors. However, to maintain a facade of a good relationship with development departments, end-users used to approach the IT Department when they would opt for an in-house development. On other occasions they would go right away to external vendors. The organisation's external website was an example of products negotiated and developed away from IT Dept involvement.

6.3.2.4 Relationship with Senior Management

Senior management support is required for project success (Jiang et al. 2002, White and Fortune 2002). Senior managers are expected to prepare the project surrounding environment making it conducive to project success (Gray 2001). Senior managers are asked to supply projects with required resources and to

define and support project members' authorities enabling them to receive the required support from other organisational departments (Johns 1999).

6.3.2.4.1 Shaping the project external relationships

As explained previously, IT Dept projects were threatened by the relationship between end-users and bus-vendor where end-users would skip IT Dept's role and communicate directly with external vendors ignoring IT Dept products and capabilities.

Project members assumed that when this study was conducted, the situation had changed. The perception of a weak IT Dept was thought to diminish after the appointment of the current VP. Project team members assumed that end-users were losing their power, viewing the new VP to be involved in controlling activities regulating end-users actions.

"Project Manager: *The organisation's website was developed by the bus-vendor directly for the end-users ... The end-users used to work with vendors away from the IT until the VP was appointed ... Now, the end-users are not responsible for those issues anymore [buying products from vendors]. Even, the website was taken from them ... the VP has reduced end-users' power ... The VP has managed to bring them back to work through the IT ... The VP clearly told them that no agreement is to be reached without IT involvement ... They are only concerned with receiving the service not who is going to deliver it."*

IT Dept senior management had shaped the relationship between end-users and external vendors. End-users needed to communicate with vendors through the IT Dept. That was seen as reducing the risk developing products internally being overlooked in favour of buying similar products from external vendors.

6.3.2.4.1.1 Shaping end-users relationship with project members

IT Dept senior managers were involved in shaping the relationship between the IT Dept and end-users. This was done in different ways. One way had been to introduce strong IT management structure which was able to regulate the relationship between end-users and vendors creating a central role for the IT Dept. Senior management were not just redirecting end-users to work via the IT Dept and eventually through project members with no further involvements. They were prominently involved in daily interactions between the two sides of the relationship.

6.3.2.4.1.1.1 Interacting with end users requests

Senior managers were not distanced from daily interactions between projects members and end-users. There were direct relationships between IT senior managers and end-users. This relationship was parallel to the continuous relationship between end-users and project members. Senior managers supported end-users' requests which affected running projects, pulling members from projects to work on different tasks or projects for the end-users.

That worried project members while working in any project because they knew that they could be given different tasks to support end-users.

"Senior Developer: The end-users do not wait. They will go and talk to the VP".

6.3.2.4.2 Shaping vendor relationship with project members

On the other hand, IT senior management were involved in defining the relationship between the IT and external vendors. IT senior managers had worked on purchasing various products to support end-users business needs and signing agreements with different external vendors. Those purchased products and signed agreements were seen to have an impact on the IT projects where project members were not involved in those decision making activities.

6.4 Third Part: a Structural Analysis

6.4.1 Project structuration

6.4.1.1 Monitoring goals definition

As explained previously, the project suffered initially from structural complexities due to ill-defined goals and multiple personal goals over the project lifecycle. On the other hand, the project was also shielded from time-related and organisational complexities. The project had the opportunity to evade technical and technological complexities if project manager decided to implement the old Web development methodology.

However, over the project lifecycle, the project was not static as the project structure changed from time to time due to project members' activities in managing project structural complexity. Hence project signification was dynamically changing as a result of project internal interactions and interactions with the surrounding environment.

6.4.1.2 Dealing with deadlines

The project was not subject to time-related complexity. Senior managers set the deadlines based on external competition and knowing the business vendor deadline. Project deadlines were agreed upon by all project participants where they regulated project goals signification. However, project deadlines were not tight and did not put pressure on project signification.

During the project, the overall deadline was broken down into sub-deadlines. The project manager suggested breaking down project goals into two phases. The first phase included informative services while the second phase included modification services [Booking Services]. First, the project manager wanted to introduce the mobile informative services. Later, the full range of mobile services were planned to be delivered. The project manager assumed that this approach would help in gaining senior management support (authoritative resources). This benefited from the relaxed deadline of the project which was a result of the bus-vendor slow development process.

***"Project Manager:** The bus-vendor is slow which can help us introducing something. This can help us to gain the senior management support ... Thus; we can first build informative mobile services which can be very rich."*

Breaking the deadline into two sub-deadlines was a reason for conflict between the project manager and the senior developer. The senior developer found that breaking the project goals into two parts and delaying the modification part into the second part might risk the chance of obtaining the privileged access (allocative resources). Deciding to go right away to the modification phase, from the beginning, would help the senior developer to request the access immediately.

Consequently, it was suggested that the project deadline be approached in two ways: either to split the deadline into two sub-deadlines or work towards the final deadline from the beginning. This created deadline uncertainty, a factor that increased the time-related complexity in the project. While project members agreed on the overall project deadline signification, they had a problem reaching an agreement on the signification of sub-deadlines the matter which increased time-related complexity. The increase of time-related complexity was related to the signification of project goals and the increase in project structural complexity especially the multiple personal goals.

6.4.1.3 Defining project method

The project had the chance to avoid the technical and technological complexities resulting from using Mobile Portal development methodology and alternatively using old Web development methodology which was used in all past projects.

This created a conflict on the signification of project technology. The senior developer preferred to build the required mobile services using the existing development methodology (old signification of web development) to escape technical and technological complexities which might expose the project to failure.

*"**Senior Developer:** But, I have a problem with Mobile Portal technology. It is not ready yet and we cannot compete with the bus-vendor using Mobile Portal. If you [project manager] want mobile services using our regular development way then yes we can have a product before the bus-vendor."*

On the other hand, the project manager did not want to lose the possibility of utilising the Mobile Portal technology (new signification of web development).

*"**Project Manager:** We don't want to be slaves of the technology [referring to current development methodology]. If you can develop them [mobile services] using this technology [Mobile Portal], so why not to use it?"*

The project manager preferred to use Mobile Portal technology for a number of reasons. First, Mobile Portal technology was purchased in 2004 and had not

been utilised yet. Also, implementing Mobile Portal was an unrealised goal hanging over from a past project which was not achieved due to time pressure. Therefore, using Mobile Portal represented a personal goal for the project manager which was inserted into the project multiple goals.

The project manager linked his signification of project technology to the VP's signification building on existing IT assets. The project regulations represented in the relaxed project deadline did not sanction project manager signification that project members were able to build expertise in use of the Mobile Portal.

The project manager adapted that signification of technology because it realised a senior management signification of goals did not violate deadline regulation benefiting from less time-related complexity. That implied that the increase in the technical and technological complexities was chosen to respond to the structural complexity benefiting from the absence of time-related complexity.

6.4.1.4 Team relations conflict

Finally, the project was not expected to suffer from organisational complexity. However, the increasing structural, time-related and technical and technological complexities, explained previously, had led to a team relation conflict where both the senior developer and the project manager developed different project

significations based on their different and conflicting views of project goals, deadlines and methods.

Their conflicted significations had been informed in their actions. The senior developer bypassed the project manager and approached the GM on an individual basis to ask for privileged system access (resources). The senior developer met the GM to ask for his approval for the access but the request was rejected. The project manager knew about the request from the GM.

***"Project Manager:** I think that the senior developer is going forward to coding. We need to study the issue first, and then at last stage we will be implementing it. Do you know that he [the senior developer] went to the GM to ask for the access? "*

This added an organisational complexity to the project where the senior developer broke away from the normal and simple hierarchy causing a split in the project team. The project manager had responded to the senior developer's action by sending him out of the project team to a training course for two days. Those two days were needed to reorganise the project in the senior developer absence.

***"Project Manager:** I have sent him [senior developer] to a training course for two days. I need to use those two days while he is in the course to arrange things within this project. He needs to be directed. He has a problem with teamwork".*

The project team was focused again on satisfying the project manager's signification of project technology. One of the junior developers suggested using

Mobile Portal as a user interface leaving the business code to run in the background using old development methodology. The project manager found that to be a suitable solution which could satisfy all team members generations shared project signification. This solution helped in regaining the unity of the project team avoiding the organisational complexity resulting from the senior developer's earlier disruptive action.

6.4.2 Organisational context undermining project context

The outer organisational context was seen to affect the internal project context. This happened when the surrounding outer context undermined project local practices. Since the project kick off, the project context was subject to actions from outer context. The project context had been affected by actions exerted by senior management, bus-vendor and end-users.

6.4.2.1 Senior management undermining project structuration

The project was open to changes from IT senior management during project lifecycle where senior managers were able to define project signification by setting project goals, deadlines and regulate project relationships with the surrounding environment.

First, the VP had asked the project manager to go on a business trip to meet the bus-vendor. The VP was able to connect the project with the bus-vendor and to choose how both parties should meet. Many options were available to choose

from when establishing a communication with a vendor. The meetings could involve inviting the vendor to visit the IT Dept or it could be in the vendor's location as a business trip. Virtual meeting over a conference call was another option. The senior management in this project decided that the project members should go on a business trip to meet the bus-vendor face to face. The signification of the relationship between project members and the bus-vendor was established solely by senior managers and project members were not consulted.

Later, the VP asked the project manager to communicate with end-users as part of the implementation of the Mobile services project.

***"Project Manager [In a desperate voice]:** The VP asked us to communicate with the end-user and work together to implement mobile services".*

The VP had defined and shaped project goals. The goals were set to involve the responsibility of building a mobile services solution. Project members were asked to explore the bus-vendor solution and to build the mobile solution on top of existing assets.

Second, the project reached a stage of a better signification where project goals and deadlines were set to build a list of mobile services in two phases. The first phase would introduce informative mobile services while the second phase would add modification services to the solution. Meanwhile, the project method

was decided -utilising both Mobile Portal for the user interface and old web development methodology for the background business code.

However, the VP approached the project manager and asked him to work with the end-users on implementing different goals. This request had changed project signification. At the same time, the role of the project team was redefined by the VP when the end-users were introduced to the project. The project team was asked to maintain IT Dept involvement in the project.

*"**Project Manager:** The VP is interested in our involvement as an IT in the solution ... At the end, it will be up to us to choose to buy or make it in-house."*

That change meant that the project team would be constrained by end-users goals and deadlines (new regulations) undermining the previously reached shared signification. The project members who would implement the new signification needed to negotiate this signification with the end-users

*"**Junior Developer:** That's it. Currently, the idea coming from the VP is that the decision is for the IT to take. If we could not do it we will buy it."*

6.4.2.2 The vendor undermining the project team technical role

The bus-vendor had dealt with the project team in a manner similar to how they dealt with end-users (informed by old signification). This meant that when considering any service, the only available option was to buy that service.

Project members viewed this attitude as appropriate to an end-user relationship. According to the project members, the bus-vendor did not make any changes to how they used to interact with the end-users where no technical representatives from the bus-vendor had met them during their business trip. They only had the chance to discuss the mobile services with sales representatives. Project members were disappointed by the bus-vendor's signification dealing with the project team as end-users.

***"Project Manager:** When, we ask about any issue, right away, they offer their own ready made products. They hadn't listened to us ... Everything is only available to buy ... They had only gathered some salesmen to meet us."*

The project team found the bus-vendor very defensive to change their signification and felt they were undermining their technical role as developers. Moreover, the bus-vendor warned the project member from playing the technical role.

***"Project Manager:** They told us that if we decide to do those services ourselves, we are getting into a nightmare."*

6.4.2.3 End-user undermining project goals

The end-users joined with complete project signification where they were working on implementing mobile services even prior to the project start. The project members were surprised by discovering many activities done by the end-users which they did not know about. They did not know that the end-user

was working on the mobile services issue for a long time and those efforts were translated into an area with a manager.

"Senior Developer: Yesterday, we met with one of the end-users. He is the manager of mobile sales."

The end-user was ready with a document including a list of goals associated with deadlines ordered into three phases. Those goals were discussed with three mobile services vendors. The end-users signification represented in their document undermined previously established project signification.

In summary, the outer context dealt with the project context in three ways. Senior managers controlled project signification and from time to time they pushed information to project members which resulted in changes to project signification. Bus-vendor used an old signification dealing with project members as end-users and they were not ready to change their signification. Finally, end-users developed their project signification away from project members and later, end-users signification was forced on project members by senior managers.

6.4.3 Responding to organisational context

6.4.3.1.1 Responding to senior management

When the VP started the project shaping project signification including the relationship between the project team and the bus-vendor, the project members

showed an acceptance to initiate a project by communicating with the bus-vendor through a business trip. However, they realised that project signification and the scope of the business trip were not well-defined. Accordingly, they worked on understanding the scope. This required referring to the VP again to receive more clarification of the scope of the business trip.

The VP request was considered as a project kick-off. However, the request undermined the local practice of working on projects with end-users (historically established structure). The VP introduced the bus-vendor as a potential player in the project. The project members could understand the exclusion of the end-users as part of the political conflict between the VP and the end-users. This situation was almost new for the project members since they were not used to starting a project working with an external vendor. The project members expected to cooperate with the bus vendor. Their response to the VP's request included two aspects.

The first aspect was their acquiescence to go on the business trip and to initiate a project working with the bus-vendor. However, the VP's scope of the business trip was not well-defined, which required meeting the VP to clarify the scope.

The second aspect was driven by 'existential anxiety' where the project member defended their technical role in the new project. Therefore, the project manager looked into the department assets and suggested to use Mobile Portal technology.

"Project Manager: *"We will be here for a week after Hajj then we will go for a business trip to meet Bus-Vendor. We need to start thinking of Mobile Portal."*

Project members' response to the VP's request could be seen as a *re-skilling* where the project members accepted the IT senior's management action which reshaped project signification (goals, deadlines and team relations) and reshaped project structuration according to senior management signification.

To adapt with senior management signification to the project, project members had spent time redefining project goals, deadlines and methods. However, the project structure, resulting from project members' activities, was undermined again by the VP's request to work through end-users goals. Again, project members expressed an acceptance of the VP's new signification and re-adjusted the project to move towards achieving the end-users goals. Project members agreed that they would follow the end-users. The project manager reviewed the end-users goals document to understand the changes which would occur to the project and had a meeting with the end-users to receive more clarification about the project goals.

"Project Manager: *I will see what the End-User wants. I will get their inputs since we are going to follow them. I need to know what is in their minds."*

The project members were expected just to maintain IT involvement in the project and to accept the end-users goals without changing them. However, the

project manager prepared another document of goals which he would negotiate with the end-users.

***"Project manager:** I prepared the second document. I reviewed different vendors' mobile services in the same sector. I compiled all the available mobile services in this document."*

At the same time, the project manager found that his team could re-order the goals suggesting earlier deadlines for some goals which would help his team to perform a technical role.

***"Project Manager:** I found that some of the features, which they put in the second or third phase, can be delivered right now.*

***Me:** So, you want to change their priorities?*

***Project Manager:** I will suggest this in the meeting. I will update their document showing the services which are available now ... I will try to sell them our services."*

Again, the project members accepted the VP's changing project significations and worked on *re-skilling* and learning end-users goals through the presented document and meeting.

6.4.3.1.2 Responding to the vendor

Project members were not happy about the reluctance of bus-vendors to co-operate with them and change their signification to project team instead of relying on old signification of organisational members as end-users. Project members realised that the bus-vendor was undermining their technical role and

only allowing them to act as end-users where products are only available for sale.

The project members resented the undermining of their technical role. They compared their products with bus-vendor's products, concluding that they were in a position enabling them to compete and win the competition with the bus-vendor.

"Project Manager: *They told us that they will have [one of the services] in April. I told them that we have it 5 years ago ... They told us about a cheap SMS provider so I asked them if it's less than 1 cent per message since that what we pay and they could not believe it."*

This led the project manager to conclude that that unlike the bus-vendor, WDG was missing the organisational support. The bus-vendor appeared to be able to benefit from their relations with third parties and outsourcing initiatives while those initiatives were hindered in the IT Dept by the very lengthy approval processes.

"Project Manager: *The bus-vendor told us that they have agreement with third parties who can develop such a solution in no time. However, this no time is three months. We can't do the same. We have a big problem with this model. In maintenance contracts which we have no choice but to do, papers keep circulating for six months till we get the approval from senior management. The process is scattered and lengthy."*

The relationship between project members and the bus-vendor was perceived to suffer from bus-vendor's bad intentions and inappropriate usage of the relationship with the organisation. The bus-vendor was accused of exploiting the organisation through the end-user and then trying to replicate the same tactic with the project team. Therefore, they are not willing to change their signification to project team.

***"Project Manager:** At the end, a Tunisian guy told us privately that they don't take any commission for these offerings and all what they want to do is to help us ... It seems that they were trying to offer us a bribe to recommend their products but we did not understand. But, what will happen if I accepted their bribe? I will go to hell."*

Project members could not refer to the agreement between the organisation and the bus-vendor. The agreement was believed to contain the regulations controlling the relationship between the two parties. That agreement was only accessible to IT Dept senior managers. Hence the project manager reported the project team disappointment with the bus-vendor's attitude to the senior managers, seeking *empowerment* which would sanction bus-vendor signification and restore another signification which consider project team technical role. However, this call for support was considered vague by the GM while the VP had only forwarded that disappointment to the bus-vendor which left no no impact on the nature of the relationship between the project members and the bus-vendor.

Faced by the previously presented uncooperative bus-vendor and after failing to receive senior management *empowerment*, the project members looked to the project as a competition with the bus-vendor changing their signification to bus-vendor from a partner to a competitor. This competition was about gaining the senior management support by producing a mobile services solution. This senior management support would be given to the project team if they could deliver their mobile services product before the bus-vendor. Accordingly, the project members decided to rely on their past experiences and the available information (existing structures) to build a mobile solution before the bus-vendor deadline which was seen as an act of *re-appropriation*.

6.4.3.1.3 Responding to end-users

As explained previously, the end-users joined the project with a complete project signification represented in a document containing a list of goals prioritised into three phases with three different deadlines. The project manager introduced another list of mobile services and tried to negotiate introducing changes to previously established signification to maintain a role in the project. However, the end-users had already discussed the goals with three different mobile services vendors. Consequently, the end-users undermined the project manager's intended changes and imposed their goals and deadlines, undermining all previous project activities.

The project manager informed end-users about their earlier iPhone application and showed them that this application was available. The end-users goals included the development of an iPhone application which was not yet negotiated with vendors. Therefore, they agreed to allow the project team to develop the iPhone application but they requested some enhancements to the application.

***"Junior Developer:** Now, the first thing they need is to start with iPhone.*

***Me:** an application on iPhone? Don't you have it?*

***Junior Developer:** The existing one uses SMSs to work. They need a regular one."*

***"Senior Developer:** I am working on a very hot issue. The DG said that we will launch mobile applications. So, now I and the Junior Developer are working on an iPhone application. Instead of using SMS, we have to use direct calls. They did not like using SMSs."*

The project members' response to the end-users undermining actions referred to the previous assets developed by the project members and benefited from their knowledgeability with end-users signification which was introduced in the end-users document. The project members managed to find a technical role in the project and developed an iPhone application. The project members built on their old assets and old relationship with end-users to obtain that role in the project. Meanwhile, the project team re-adapted the method which was developed in earlier stages in the project to be used in the development of the iPhone application. The project team agreed to re-build the iPhone application

where the senior developer developed the business code in the back-end using old web development methodology while the junior developer used iPhone development methodology in the user interface instead of using Mobile Portal technology. Responding to the undermining actions of the end-users in that way was considered as a *re-appropriation* response.

6.4.4 Reflexive Monitoring Challenges

6.4.4.1 Team members challenges

It is asserted that project learning is hindered by overestimating project manager's knowledge while ignoring the contribution of other project members (Williams 2003) where, as it has been asserted by Lindkvist et al. (2002), project success requires generating learning knowledge by all team members.

In the mobile services project, all project members were monitoring the progress of the project. This included the project manager, the senior developer and junior developers. All available information was given to all project members. Sharing information with all project members allowed them to contribute their ideas in defining project goals, methods and deadline generating shared project signification.

The project manager had suggested splitting the deadline into two sub-deadline introducing project goals in two phases. The first phase would include the informative mobile services and the second phase would include the full

modification mobile services. At the same time, the project manager encouraged the use of Mobile Portal technology.

Previously, the senior developer had expressed his rejection of adapting Mobile Portal technology and splitting the project into two phases. The senior developer wanted privileged access to the system and favoured implementing the project using old web development methodology.

This conflict between the two significations was not resolved by underestimating the senior developer's knowledge. The project manager did not impose his view on the senior developer. The two conflicted significations were monitored by other project members. Hence the junior developer introduced his solution of using both technologies at the same time thus allowing the senior developer to use old web development methodology in the background business code while the junior developer would use the Mobile Portal technology in the user interface. The new project signification was integration between the two conflicted significations.

It is suggested that project learning is hindered by project member's unwillingness to share their insights with others (Schindler and Eppler 2003). In this project, all project members showed a positive attitude and an interest in sharing their knowledge and having a positive impact on project goals, deadlines and methods the matter which helped them to generate a shared project signification.

6.4.4.2 Organisational challenges

Organisational support is assumed to facilitate project learning (Schindler and Eppler 2003). Organisational support facilitates learning by allocating the required resources. The organisation is expected to act upon the information generated from the project experience (Turner et al. 2000, Huang and Palvia 2001).

Project members were continuously monitoring the project from the very beginning of the project. During monitoring, project members identified the need for organisational support in different cases.

First, when the project manager was asked to go for a business trip, the project members found the need to clarify the scope of the business trip. The project manager tried to clarify the scope from the GM but he could not.

***"Project Manager:** The GM does not talk in a clear and direct way. I asked him about the purpose of the business trip but he did not tell me. He was busy from laptop to phone".*

Second, the details of the agreement between the IT Senior managers and the Bus-vendor had not been ever shared with the project team. This made the involvement of the senior management essential when dealing with vendors. The project manager recalled his experiences with another vendor saying:

***"Project Manager:** Similarly, when we were dealing with the Tech-Vendor, we could not do anything until the VP met them. He knows all about those agreements".*

Third, the project manager had realised that the bus-vendor was not considering co-operating with the project team systems. This disappointed the project team as they could not obtain the bus-vendor technical support. The project manager expressed the project team's disappointment in an email sent to the VP expecting the VP to regulate and correct the nature of the relationship between the project and the bus-vendor. This did not happen where the VP only forwarded that email to the bus-vendor. This email was not seen to be enough and did not rectify the relationship.

Finally, the project manager reported the project team reservations about the bus-vendor to the VP and the GM. However, the GM expressed his mistrust in the project manager and his team. The project manager felt that the GM was against the project team and not giving them the required support.

***"Project Manager:** later, the GM phoned me and I told him about our opinion. He (the GM) described the report as a vague report. What can I do more for him? ... He (the GM) says that we [project team] are sitting doing nothing. He said that even people from other departments say so. If he says this, it is imaginable that other people from other departments may say the same. He should come and ask us to see if we are busy or not."*

In summary, the project was missing organisational support. The senior management did not respond to the project needs. They did not give the

required clarification when needed and did not supply the project with the agreement between the organisation and the bus-vendor. Moreover, the GM expressed his mistrust of the project team. In other words, the project team needed organisational support to first generate a shared project signification with senior management. Second, they needed an access to the agreement regulating the relationship with the vendor. Third, the relationship between project members and surrounding context should be built on trust. On the other hand, project team needed to share common project signification with vendor especially sharing an agreement the roles of each party including technical roles.

6.4.4.3 Content-type challenges

Knowledge types are assumed to affect project learning which is assumed to cover both explicit and tacit knowledge (Williams 2003). Meanwhile, tacit knowledge consisting of insights and experiences is challenged by being not easily communicated. On the other hand, explicit knowledge is challenged by the quality of generated documents where documents should not be superficial and should be generically documented and written in an understandable way (Schindler and Eppler 2003).

In the beginning of the project, the senior management did not clearly define the purpose of the business trip and the relationship between the project and the bus-vendor. Clarification of the business trip was obtained in face-to-face

meetings where project members were asking the project manager to meet face-to-face with the VP or the GM to receive more clarifications. In some cases, meetings would fail and the required clarification was not received, which would entail more meetings to resolve matters.

***"Project Manager:** The GM does not talk in a clear and direct way. I asked him about the purpose of the business trip but he did not tell me. He was busy from laptop to phone".*

Senior managers relied on verbal communication when dealing with project members. At any point in time, senior management had an access to push knowledge verbally to the project team. This knowledge was seen to have a noticeable effect on project signification. This effect involved shaping project goals, deadlines and project relationships with the outside world. The first two project goals were associated with the VP's intentions, being obtained from the project members brief meetings with the VP.

***"Project Manager:** In conclusion, we did not understand the purpose of the trip until we met the VP who said clearly that we have agreements with the Bus-Vendor. The VP told us that we are entitled to have all the Bus-Vendor's web services for free. The VP wants us to build on top of our existing assets. Let's use their web services and make our front end."*

The relationship, constructed through verbal communications, occurred in one direction and was put in a command form. Senior management had an access through verbal communications to shape project properties. However, project

members were not able to use the same verbal channel due to the senior management's busy schedule. Therefore, dropping an e-mail was used to leave a feedback to senior management. Those feedbacks did not leave an effect on shaping the relationship and obtaining more detailed information. Rather it was considered as a symptom of inability to tackle project problems and expecting senior management to handle all project details.

The project did not have frequent access to explicit documents. However, the project manager realised the need to have the agreement document between the organisation and the bus-vendor. That document had not been ever shared. All that was known from the agreement is what the VP referred to in his meeting with the project manager. No other details were shared. This made the involvement of the senior management necessary when dealing with vendors. This was a common practice. The project manager recalled his experience with another vendor saying:

*"**Project Manager:** Similarly, when we were dealing with the Tech-Vendor, we could not do anything until the VP met them. He knows all about those agreements".*

On the other side, the project manager complained about the nature of the relationship with the bus-vendor. The relationship involved exchanging documents describing the required parameters to implement bus-vendor web services. The documents were perceived to be inadequate when it came to answering emerging technical questions. An interactive technical

communication mode was needed during development and testing phases of the project.

Similarly, the senior developer asked the project manager to initiate interactive communication with end-users. The senior developer wanted to gather information about how to use the 'Add' and 'Change' business commands and the business rules associated with those commands.

In summary, verbal knowledge, received from the senior management, was not clear and resulted only in sharing incomplete project signification. The project members did not complain about the nature of that knowledge, rather they called for more face-to-face meetings with IT senior management to generate shared project signification with senior management. Senior managers controlled the face-to-face communication channels and had an access to push new information from time to time to project team limiting project team to give feedback via email. On the other hand, project members were calling for opening an interactive communication with the bus-vendor and the end-user to exchange experiences rather than relying on sharing documents and emails. Explicit documentation was only required to regulate the relationship between project members and the bus-vendor which was only accessible to senior managers and not to project members.

6.4.4.4 Spatial challenges

Project learning is assumed to be part of everyday activities and to be occurring naturally where learning is not limited to post project review meeting rooms, rather it happens everywhere (Schindler and Eppler 2003).

The relationship between project team members and the End-users were hindered by the geographical distance. The end-users were not located in the same IT building and they were not in the same side of the city. Therefore, communications between the two parties were happening in face-to-face meetings which needed arrangements and required travelling across the city. Meetings were not common. They were only used once or twice during the project. Most of the time, communications were happening over phone calls. Those phone calls were facilitated by the shared experiences between the two parties over multiple projects.

Similarly, the bus-vendor relationship was hindered by space. The bus-vendor was located in Nice. The project team had the chance to meet the vendor once, when they went on the business trip. Later, the project team would only use emails to communicate with the bus-vendor.

Physically close relationship with the VP was expected to be very helpful to the project members since it would give them the ability to contact the senior management in face-to-face meetings. This was expected to help in

understanding what senior management wanted from the project and generate shared signification.

While all IT senior managers were located in the same building, meeting them was not an easy task. Senior management used to be frequently travelling in business trips or attending meetings in other organisational buildings.

As an example, when the project manager returned from the business trip, he tried to meet the VP or the GM to give his feedback about the business trip. This was not possible because of the senior managers being unavailable.

When the senior management were in the IT building, the GM was seen to spend most of his time in the VP office in the 8th floor. The VP office was not easily accessible where the VP's secretaries would stop anyone from meeting the VP. Mostly, the VP would send for project members to come to his office when they were required.

Project members needed face-to-face meeting with external parties to facilitate the generation of shared project signification and to ask senior managers to regulate vendor and end-users actions. Project team suffered from the geographical distance obstacle separating them from senior managers, end users and vendors. Geographical separation forced project team to use emails as a way of communicating. Meanwhile with end-users, geographical issue was

solved by having few meetings in the beginning of the project and then continuing through phone calls.

6.4.4.5 Time-related challenges

Project members are supposed to be involved in learning as part of all project phases (Stewart 2008). Project learning is assumed to be part of everyday activities where learning from an activity feeds the next activities. However, project learning may be hindered by limited time (Schindler and Eppler 2003).

As explained previously, senior managers relied on verbal communication when dealing with project members. Meanwhile, project members appreciated face-to-face meetings and were asking frequently to meet face-to-face with the VP. Understanding senior manager's verbal commands and generating shared project signification required more face-to-face communications with the senior management which were not achievable because of senior management's busy schedule. Senior managers were most of the time busy attending other meetings and involved in other tasks.

Meetings with senior managers were usually quick. They were held at short notice. Also, the senior managers were used to saying what they wanted without interruptions.

***"Project Manager:** You are asked by the secretary to meet the VP ... You go there expecting the talk to go in a specific direction and the VP to ask about*

the progress of project work but he asks us to do something else ... You go out to work on realising his commands but you don't get the chance to get back and continue discussing the issue again".

Accordingly, the project members would wait until they were called to meet the senior managers.

"Project Manager: *In conclusion, we did not understand the purpose of the trip until we met the VP who said clearly that we have agreements with the Bus-Vendor. The VP told us that we are entitled to have all the Bus-Vendor's web services for free. The VP wants us to build on top of our existing assets. Let's use their web services and make our front end."*

Time-related challenges have affected the relationship between project members and the bus-vendor. The project members had managed to build a relationship with one of the bus-vendor support team. Information was communicated over e-mails but was hindered by time. E-mail was not much hindered by the time differences (two hours between Saudi Arabia and France) rather it was affected by the weekend difference between the two countries. The weekend in Saudi Arabia is on Thursday and Friday while it is on Saturday and Sunday in France. That reduced the overlapping working days to only three days a week.

"Project Manager: *Imagine when we have a problem on Wednesday and we email it to him [bus-vendor support]. We leave the office without a reply. Later, when we are back to office on Saturday, I get shocked by reading an email requiring more details or showing misunderstanding of the problem. At that*

moment, I get so disappointed. I know that my reply is not read until Monday."

In summary, time-related challenges represented in busy schedule, short length of meetings and unknown meeting time constrained project members ability to involve in project structuration with external parties. On the other hand, e-mails did not solve the temporal problem because of the weekend difference and the absence of regulation to force parties to reply to emails in sensible time.

6.5 Conclusion

The project had started with limited time-related and organisational complexities. Similarly, it had the option to avoid technical and technological complexities by applying old development methodology. The project had only suffered from structural complexity where project goals were ill-defined and other personal goals were added to the project.

On the other hand, old projects were building on a *pre-project partnering* between project members and end-users where end-users used to have the power to choose to develop products working with external vendors or to elect in-house solutions working with IT project teams. That subjected IT activities and products to be ignored by end-users. To overcome this, IT senior management had worked to eliminate that risk by shaping the relationship between the IT and end-users.

Project members were seen to be aware of the internal and external context where they acted upon their own knowledge, trying to manage both the internal project complexities and the external surrounding context.

Project complexities were not static across project lifecycle where different complexities were not discrete but were impacting on each other.

Project structural complexity had resulted from ill-defined project goals and multiple personal goals. The project manager chose to increase technical and technological complexities by choosing to implement the new Mobile Portal development methodology. The increase in technical and technological complexities was assumed to help in addressing structural complexity, benefiting from the absence of time-related complexity. However, the project manager's actions to address structural complexity led to increasing time-related complexity splitting the deadline into sub-deadlines. Choosing to increase the time-related complexity and technical and technological complexities had led to a conflict between the project team increasing the project organisational complexity. Consequently, the project complexity had been structured over the project lifecycle moving from lower complexity levels to higher complexity levels.

In addition, the project was not distanced from the effect of the surrounding context where IT senior managers, bus-vendor and end-users actions were observed to undermine project local signification. First, IT senior managers

undermined the *pre-project partnering* between project members and end-users where past project were based on this relationship. Second, IT senior managers re-introduced end-users to the project in a manner which undermined ongoing project structuration developed over the project previous phases. Similarly, bus-vendor undermined the project team technical role and end-users undermined project goals and deadlines. Both parties did not accept to work with project team to generate shared common project signification.

In confronting those undermining actions, the project members had adapted different strategies. First, they adapted to the IT senior management's undermining actions by changing their project signification. The project team accepted working with the bus-vendor contrary to the local practices and later they acquiesced working with the end-users. Whenever the exerted changes were not well-defined (incomplete signification), the project team referred to their knowledgeability and modified the change to fit with the local context. On the other hand, the project members failed to obtain IT senior management empowerment to change the bus-vendor's signification and consequently undermining actions. Therefore, the project members' response to bus-vendor and end-users involved acts of *re-appropriation* where project members referred to their products and experiences (signification and old structures) to modify the undermining actions.

Finally, the project team knowledgeability of the internal and surrounding context was not perceived to be absolute and their ability to monitor the project was bounded by team members, organisational, content-type, spatial and time-related challenges. Those challenges limited project members' knowledgeability and affected their actions. First, all project members had participated in generating project knowledge. Information was exchanged with all project members and their opinions and views were welcomed. Second, the project did not manage to build shared project signification with senior management, end-users and vendor. Third, face-to-face meetings were the main communication channel in the project. However, tacit experiences which help in building shared project signification were not easily communicated and project members found the need for more frequent meetings. Fourth, spatial challenges hindered exchanging information with vendor and end-users who were geographically located in different locations away from the project team location. Meanwhile, the inability to access IT senior managers affected the exchanging of information and obtaining their support (shared signification or regulation). Finally, the frequency, length and times of the meeting proved to affect project reflexive monitoring. At the same time, the communication channel with the vendor was affected by weekend differences between the Saudi Arabia and France.

Chapter Seven: The Portal Security Project

7 The Portal Security Project

7.1 Introduction

This chapter describes and analyse the Portal Security Project. The project involved securing a portal implementation which was an outcome of a previous project and the Portal Security project was complementing it. The project involved the interactions between WDG and two outsourcing companies. The first company was responsible about operation services (ops-contractor) and the second one was responsible about Portal technology administration and configuration (tech-contractor).

Similar to the fourth chapter, this chapter is divided into three parts. The first part introduces an outline of the project events. The second part describes project complexity and the surrounding non-project context. Finally, the third part uses structuration theory to understand project activities across space and time.

The first part presents the story of the Portal Security Project. The story is presented in a chronological order illustrating illustrates project activities from initiation to termination highlighting the main events occurring during project lifecycle.

The second part highlights the challenges facing the project due to internal project complexities and external surrounding context. First, it explains project complexities illustrating the four types of complexities: time-related, technical and technological, organisational and structural complexities. Second, it shows the relationships between the project context and the surrounding external non-project context describing the relationship of project members and the contractors and other organisational departments. At the same time, the second part shows the effect of the surrounding organisational context on the project activities showing how senior management and Data security manager played a role in regulating the relationship between the ops-contractor and project members.

Finally, the third part adapts structurational perspective to analyse project activities starting with illustrating the dynamics of project complexities showing their changes over project lifecycle and showing the relations between different types of project complexities. Second, a description of the interactions between the project context and the surrounding context is represented showing how the surrounding context played a role in undermining the project context and how the consultant responded to those actions adapting three modes of responses: re-skilling, re-appropriation and empowerment. Finally, this chapter illustrates the challenges which were affecting project members' monitoring of project activities. Those challenges are categorised into five

categories: team members, organisational, content-type, spatial and time-related challenges.

7.2 Part One: Project Timeline

The Portal Security project was undertaken to complement a previous project (Employee Portal). The project goal was to secure the Employee Portal by adding a security layer compliant with the new IT Single-Sign-On (SSO) policy.

The Portal Security project started when the project manager approached the operations services contractor (ops-contractor) manager inviting him to participate in the project. The project manager asked the ops-contractor to deliver a security solution prior to 7 Dec 2010 which was the cutover date of the Employee Portal project.

The ops-contractor manager suggested two solutions to secure the Employee Portal. The first solution was a limited security solution which involved securing the portal based on web-pages URL addresses while the second solution was a full solution based on the page content. The ops-contractor manager preferred the second solution but he added that the full solution would require the organisation to purchase the security tool license.

To participate in the project, the ops-contractor asked for the involvement of GM Development before kicking off the project. When approached, the GM in his

turn asked for the involvement of Data Security (DS) manager to assure the compliance with IT security policy.

The DS manager invited all the parties for a meeting in his office to announce the project start. In the meeting, the ops-contractor changed the information given to the project manager and confirmed that the organisation had a license of the tool required for the second approach. The meeting ended by choosing the second security approach as a project goal and the ops-contractor manager was asked to send a plan recording the required tasks and their deadlines.

The ops-contractor manager sent later that his group activities in the project would start after Hajj freeze period ending 22 Dec 2010. The project manager found the start date to be unacceptable and asked for an immediate start but the ops-contractor manager ignored that email and did not reply.

Later, the project manager realised that the ops-contractor manager was preparing to leave the organisation where another manager would replace him. Therefore, he did not want to make any commitments before leaving. The project manager continued chasing the ops-contractor manager with e-mails asking for timeline update. Finally, the ops-contractor replied stating that a plan would be sent the following week confirming that the start date would be on 1 Dec 2010.

The ops-contractor manager left the organisation to India and the new manager had arrived and took his place. The new ops-contractor manager did not send the plan and did not start the work as promised by the previous manager.

The project manager referred to the DS manager to follow up with the ops-contractor. The DS manager did not receive any reply to his follow-ups with the new ops-contractor manager. Therefore, He sent a harsh email threatening that if a reply was not received on the same day the issue would be escalated to the IT senior management.

On the same day, the ops-contractor manager replied stating that the project was delayed because the ops-contractor engineer who was working on the project was hospitalised for acute health problems. He added that a new engineer working remotely from India was assigned to work on the project and he would send a detailed plan next day. However, a high level plan was sent one week later reporting that the project would start on 14 Dec.

The activities did not start on the specified date. Meanwhile, the project manager realised that the ops-contractor engineer had opened a communication channel with another contractor engineer (tech-contractor). This channel was established without the approval of the project manager the matter which made him angry. The project manager requested all communications to be through him. Later, the tech-contractor sent requesting

the project manager approval to share access with ops-contractor. The request was approved.

When the project manager did not receive a reply for his inquiry about the project progress, he sent an email asking for an update before end of the day. The ops-contractor engineer sent a status update referring his reply delay to having a limited access to email.

Ten days later, the ops-contractor manager confirmed that they have finished their part in the portal security asking the project manager to start testing. The ops-contractor manager sent calling for a meeting to sign off their work but the project manager asked for more time to properly test the Portal security environment.

The environment was not functioning properly. Therefore, the ops-contractor went back to work on fixing the installation problems. Later, the ops-contractor engineer sent a status update confirming that they would finish their tasks by 25 Jan 2011. On 26 Jan, the city was flooded and the ops-contractor reported that the flood had resulted in an IT shutdown which affected their work.

Two weeks later, the ops-contractor engineer sent announcing the completion of their work and readiness for testing. During this period, the project manager had the chance to meet the VP and ask for his support. The VP recommended the project manager to only give the ops-contractor until the end of that week. If

the ops-contractor did not deliver a solution, the project manager should terminate the project.

The ops-contractor called for a meeting to introduce their work to the project manager. During the meeting, the ops-contractor manager and engineers were introducing test scenarios showing how the system was secured. When the project manager asked for a change in one of the test scenarios, the ops-contractor engineers could not simulate the change but they promised to show it later. At the same time, the project manager asked for adding some enhancements to the solution and the ops-contractor promised to implement them.

The project manager realised that the ops-contractor did not deliver the pre-defined full security solution rather they only introduced the limited security solution which was not what they agreed to do in the kick off meeting. However, the project manager considered to acceptance of the given solution to end the project.

At the same day, the GM Development called the researcher asking about the outcomes of the meeting with the ops-contractor. The ops-contractor engineer was preparing to come to the IT to replicate the solution in production environment. The project manager worked on preparing the environment before the arrival of the ops-contractor engineer requesting approval on the production environment changes from the DS manager.

Meanwhile, the project manager continued testing the environment but the results were not encouraging. The project manager was not confident with the solution.

IT senior managers had established a new department and moved the tech-contractor engineers, who were reporting to the project manager, to the new department.

The ops-contractor engineer arrived at the IT and tried to fix the problems in the solution. In a meeting with the ops-contractor engineer, the project manager asked about the reasons which did not allow ops-contractor to implement the full security solution. The engineer answered that that was due to a limitation in the product. The project manager doubted the answer and asked the ops-contractor to confirm that with the tool vendor. The vendor reply confirmed that the tool was capable of delivering a full security solution.

Next to the vendor confirmation, the ops-contractor continued to work on delivering the full solution but they asked for the project manager approval on that full solution. They requested the project manager to give an official approval on the specifications of that solution. The project manager ignored to send the required approval but the ops-contractor referred to the DS manager to ask for collecting the approval from the project manager. Finally, the project manager sent an official approval of the goals specifications.

Later, the GM asked the project manager about the status of the project. The GM expressed his disappointment with both the ops-contractor and the project manager. He explicitly asked the project manager to stop wasting time and to terminate the project.

The project manager continued testing and communicating with the ops-contractor. Every time, he finds a problem and they promise to solve it. The project manager asked for a deadline and an end for the problems but the ops-contractor failed to give one.

Finally, the project manager approached the DS manager to terminate the project. The DS manager invited his GM and GM Development to attend a meeting to make the termination decision but the GMs did not accept the invitation.

GM Development told the project manager to terminate the project. Therefore, the project manager sent an official email to the DS manager terminating the project and sent an email to the new middleware group requesting to restore the Employee Portal servers and remove all changes made by the ops-contractor.

The DS manager called for a meeting inviting the program director who was responsible for the ops-contractor work and payments. In the meeting, the ops-contractor manager confirmed that his group had finished their work and it was

ready for testing. The program director asked the project manager to give them one last chance. The project manager accepted that stating that he had clear directions to terminate the project and he would take the responsibility and give them the last chance. In the last test, the implementation proved not to be working properly. Therefore, the project manager sent to the program director informing him that the test failed and the project was officially terminated.

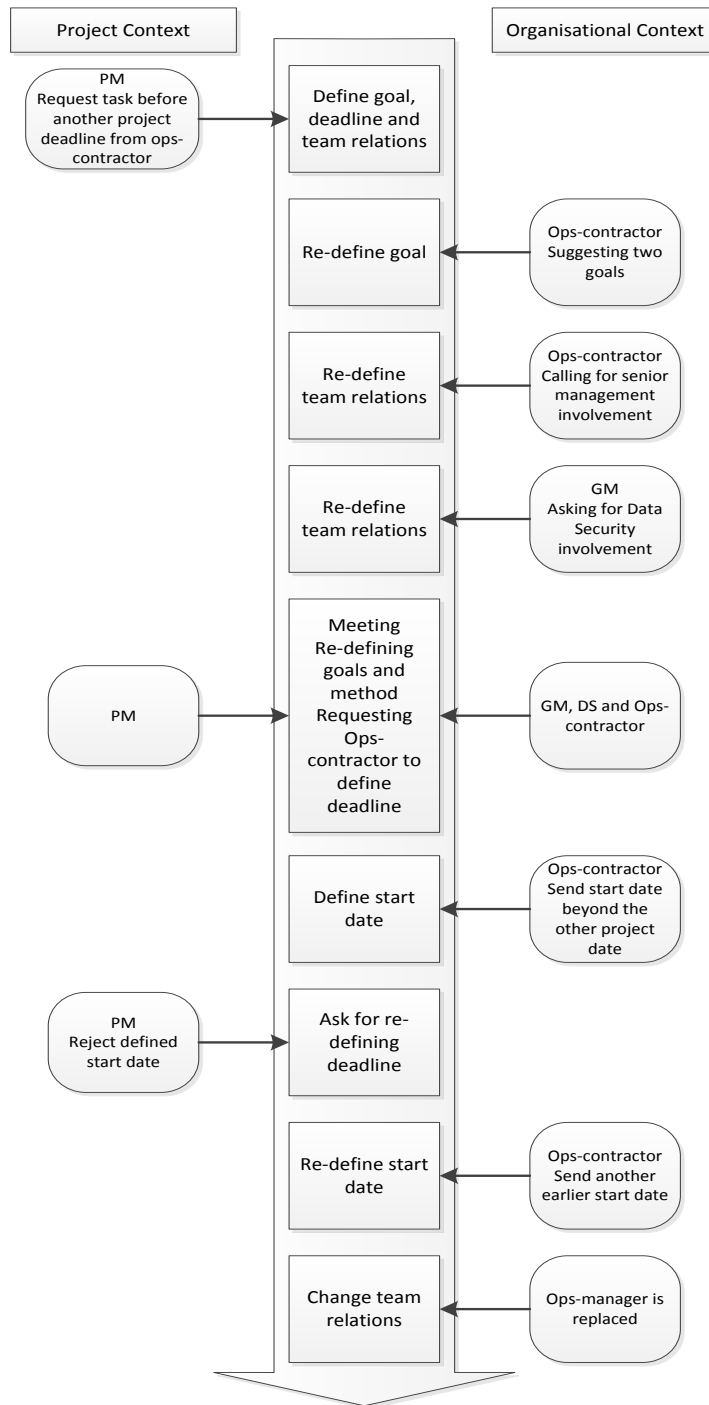


Fig 7.1 Portal security project timeline (Part 1)

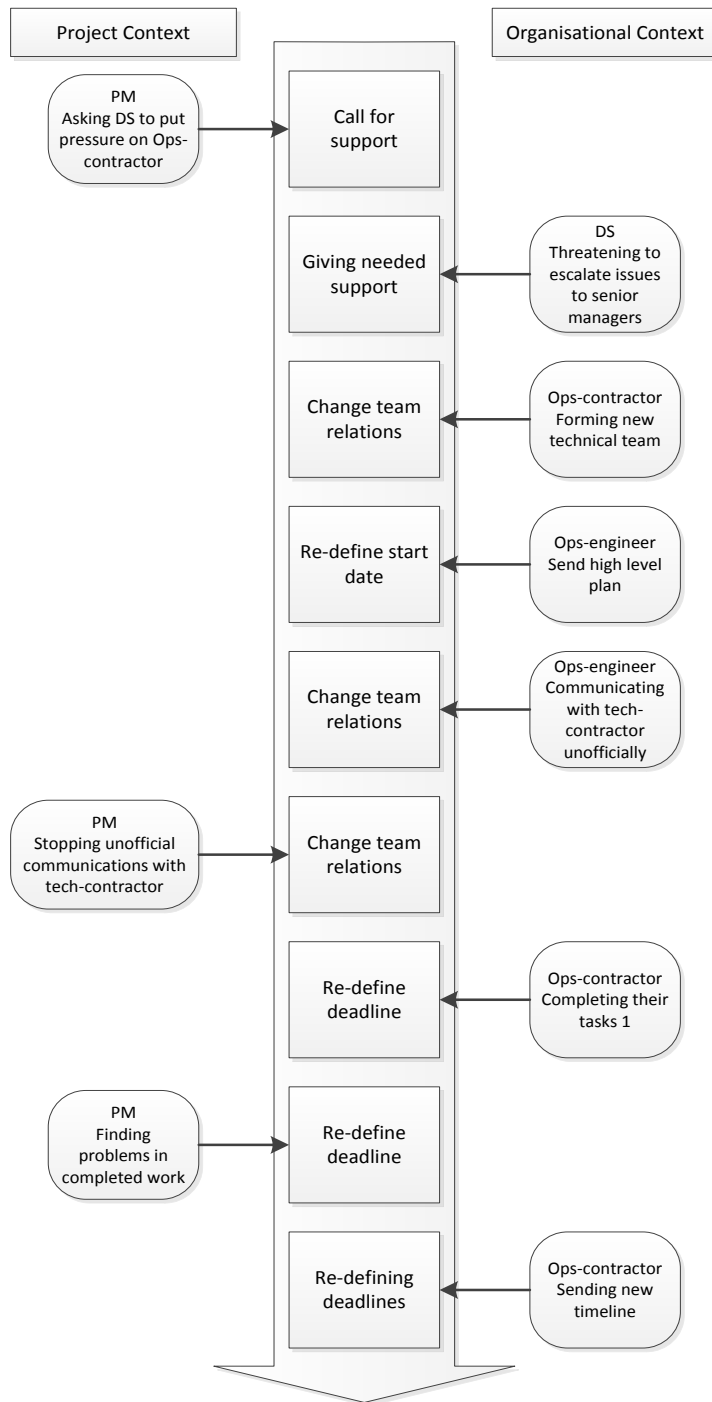


Fig 7.2 Portal security project timeline (Part 2)

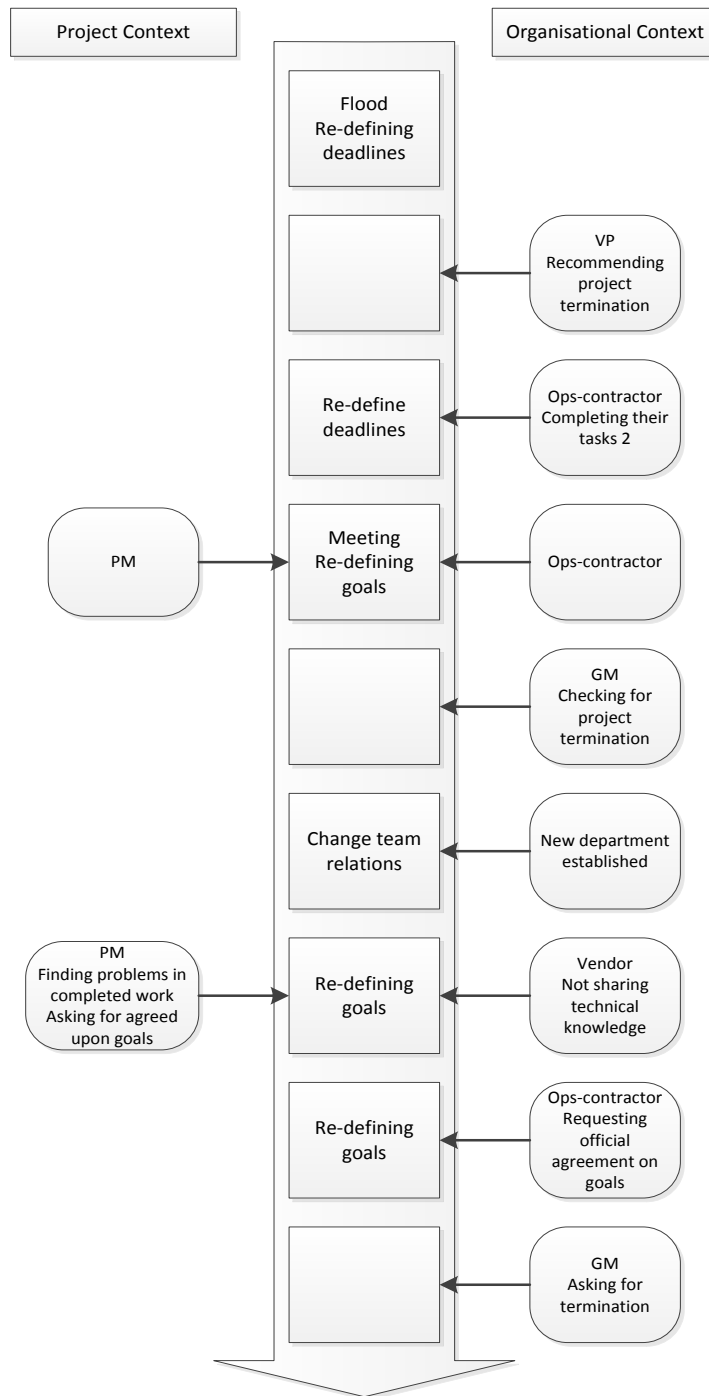


Fig 7.3 Portal security project timeline (Part 3)

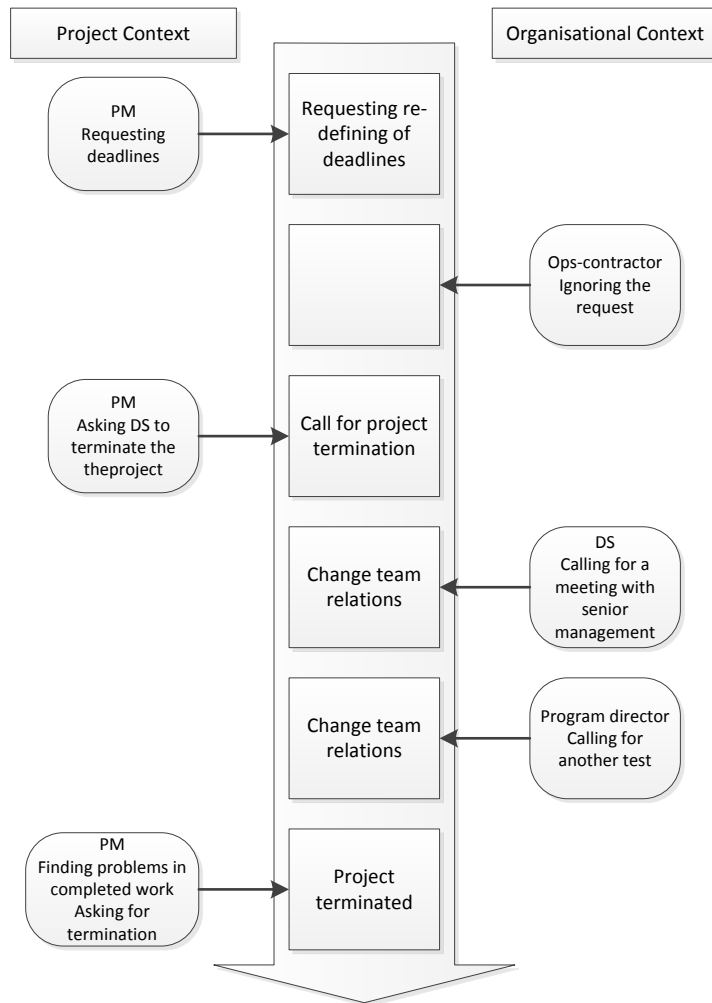


Fig 7.4 Portal security project timeline (Part 4)

7.3 Part Two: Project Complexity and Surrounding Context Challenges

7.3.1 Project Complexity

7.3.1.1 Structural Complexity

Structural complexity is perceived to rise from the multiplicity of project goals and the interdependency between those goals (Baccarini 1996). Meanwhile, structural complexity is expected to increase due to the multiplicity of personal goals in projects (Briner and Geddes 1990, Kliem and Ludin 1995 cited in Gray 2001).

The Portal Security project was assumed to be a very simple project with a well-defined goal where the project was clearly about securing the Employee Portal in compliance with the new IT Single-Sign-On policy.

The ops-contractor introduced more details clarifying the project goal offering two alternative detailed views to the main goal. The first was a limited security solution securing the Employee Portal based on web page URL addresses while the second was a full security solution based on page contents.

The second proposed detailed goal was chosen to be the project goal. The project manager stressed on the clarity of the project goal when he had written

the details and specifications of the goal and shared them with the ops-contractor manager:

"From: Project Manager

*Let me write it down (project goal specifications)
with my language to state our basic requirements."*

Later in the project kick off meeting, an official agreement was reached on the detailed project goal as expressed in the DS manager's email.

"From: DS manager

To: Meeting Attendees

*Reference to our last meeting with concerned area on
Tuesday 2nd November in my office related to below
raised issues [portal security implementation],
clarification and agreement on the approach of
Single Sign On deployment (SiteMinder) on new portal
setup were reached ..."*

That official agreement led the project to have one official goal which was defined in details in the project manager e-mail. That email was shared by meeting attendees and the ops-contractor manger committed to implement all specifications of the project goal.

At the same time, the project included a personal goal for the ops-contractor where the ops-contractor was committed to develop the Single-Sign-On solution. SSO solution was supposed to integrate with different organisational systems but ops-contractor attempts to integrate with other systems were failing. The ops-contractor was supposed to be penalized with payment

deduction as a result of those failures. Therefore, delivering the Portal Security project was assumed to help the ops-contractor in avoiding deductions. That formed a personal goal for the ops-contractor.

"DS Manager: (The ops-contractor's] work is based on trial and errors ... they tricked us since there is no dedicated team for SSO ... They are only interested in maintaining the contract and not having any deduction."

Finally, although the project had two goals from the beginning, next to the kick off meeting the project ended including only one single goal. That goal was to introduce a full security solution for the Employee Portal. At the same time, the project included a personal goal for the ops-contractor which was dependent on the achievement of the first goal.

7.3.1.2 Technical and technological complexity

Technical and technological complexities emerge from the complexity of the applied project method. Uncertainty of project method (Williams 1999, Turner and Cochrane 1993), multiplicity of tasks (Jones 1997) and inputs (Baccarini 1996) and the interdependencies between tasks and inputs increase technical and technological complexities. At the same time, the increase of the number of specialities and the interdependencies between applied tasks and inputs lead to an increase in technical and technological complexities (Baccarini 1996, Jones 1997).

The previously proposed two goals, in the beginning of the project, were offered in relation to two different tools. Mainly, the technology which was going to be used was CA-SiteMinder which had two components. One was a SiteMinder plug-in while the second was *SiteMinder Web Access Manager*.

Using the first component would enable the achievement of the limited security solution while using the second component would help in building a full security solution.

*"From: Project Manager,
[The ops-contractor manager] offered two approaches to solve the issue. The first one is to add SiteMinder plug-in in all our servers. He is not in favour of this approach as he is saying it has some drawbacks. The second approach is to install the SiteMinder Web Access Manager (similar to TAM) which Ops-Contractor needs to buy its license."*

The availability of the two technologies was not clear in the beginning. In the first meeting with the ops-contractor, he stated that the organisation only had a license for the first component while if the second component was required then there would be a need to buy its license. However, that had changed during the kick off meeting and in the presence of the DS manager who would have information about the available security tools licenses in the organisation. In the meeting, the ops-contractor manager confirmed that the organisation had the licenses of both the first and the second component.

The kick off meeting had ended to agree on using SiteMinder Web Access Manager which would enable the implementation of a full security solution. That allowed project members to have a clear and well-define method from the beginning of the project.

The project required the integration between two technologies which was Portal technology and Security technology. The requirement to integrate those two technologies was expected to increase the project technical and technological complexities.

7.3.1.3 Organisational complexity

Organisational complexity is assumed to reflect the complexity in project organisational structure where it increases due to the increase in the number of members and groups participating in the project as well as due to the increase in the interdependencies between participating members and groups (Lindkvist et al. 1998). Horizontal differentiation complexity is a result of the number of units and departments while vertical differentiation is a result of the depth of the hierarchy (Baccarini 1996).

The project involved different groups participating in project activities. The project built on top of the implementation of Employee Portal project. Therefore, the project team consisted of the Employee Portal project team. That team consisted of WDG developers and managed by the project manager. At the

same time, the project team involved the participation of the tech-contractor expert. The new project required the involvement of the ops-contractor. Meantime before the project kick off, the ops-contractor asked for the involvement of the GM Development who in his turn asked for the involvement of Data security.

Each group had its own role in the project. The tech-contractor were specialised in portal implementation. They knew the details of Employee Portal implementation and they would be required for changing the Portal security configuration. The developers had developed all applications running on the Employee Portal and they would be required to change the application design based on the new security solution. At the same time, they were able to test the new Portal Security because they were familiar with the applications behaviour and their security requirements. The DS involvement helped the project in complying with the security policy. At the same time, DS was responsible of supervising the ops-contractor activities related to security and report their observations to the program director responsible for managing the relationships between the IT and the ops-contractor. Finally, the ops-contractor was assumed to build the security layer and request the changes required to be implemented by the tech-contractor and the developers.

Both the tech-contractor experts and developers were reporting to the project manager. On the other hand, the ops-contractor employees were reporting to

their ops-contractor manager. Meanwhile, ops-contractor's activities were supervised by the DS manager.

The project was found to have an increasing organisational complexity. First, the project included different multiple groups. Each group had different specialities. The increase in the number of groups and specialities were assumed to add to the vertical differentiation dimension of organisational complexity. From the other side, the depth of the hierarchy did not add to vertical differentiation where every member was only reporting to one direct manager in each group. On the other hand, the interdependency was high in the project where the ops-contractor needed information from the project members especially from tech-contractor.

In summary, the project had an increasing organisational complexity which was resulting from horizontal differentiation and interdependencies resulting from the increasing number of groups and specialities participating in the project as well as from the interdependencies between various groups.

7.3.1.4 Time-related complexity

Project time-related complexity stems from time pressure exerted on projects from external context (Williams 1995, 2003), uncertainties in defining deadlines, changes in deadlines (Manning 2008). The Portal Security project was observed to suffer from an increasing time-related complexity. First, the

project deadline was pressured by different external factors involving organisational and non-organisational factors. External factors increased project time-related complexity. Second, deadlines suffered from uncertainty during project lifecycle where project members were not able to reach an agreement on a well-defined deadline.

7.3.1.4.1 External time pressures

Project deadlines were subject to time pressures from external context. First, project deadlines were subject to organisational events and calendar. In Hajj season, the organisation enacts a freeze period limiting changes to the environment. Due to the Hajj freeze, the ops-contractor manager decided to delay the project implementation deadline to the end of the freeze.

"From: Ops-contractor manager

*Activity will be started after Hajj holidays. ...
The plan will be to implement change after Hajj
freeze period i.e. 22nd Dec 2010."*

Second, defining project deadline was pressured by another project deadline. The Portal Security project was initiated to build a security layer for another project (Employee Portal) which had a specific cutover date. That was highlighted in the first email written by the project manager to the ops-contractor manager even before the project official kick off:

"From: Project Manager

To: Ops-contractor manager

Your ASAP response is highly appreciated as we are already in HOLD state of the project pending resolution of this issue and in risk of not committing to the cutover [of the Employee Portal project] date of 7 Dec, 2010."

The Employee Portal project had a deadline on 7 Dec 2010. Therefore, the Portal Security Project was required to complete before that deadline. That was adding a pressure on the project deadline definition.

7.3.1.4.2 Internal deadlines uncertainty

Despite the well-define deadline which the project was supposed to progress towards (7 Dec 2010), the project deadline suffered from uncertainty. That was noticed in many incidents. The ops-contractor was asked to report their tasks timeline. However, they were not replying with a well-defined deadline. The project manager complained several times about the uncertainty of the project deadlines.

"From: Project Manager

Gentlemen, this issue is bouncing for 2 months now (since 24th Oct) and still no tangible progress. ... It is not clear how much we are progressing and to what limit or when should we finish. We tried to meet with you or get a detailed plan, but still with no success."

Deadlines uncertainties were observed in different forms. First, project manager's emails requesting a well-defined deadline were ignored several

times. The ops-contractor would not respond to project manager requests the matter which made the project manager to send many emails requesting a clear timeline.

"From: Project Manager:

To: Ops-contractor engineer

Kindly, advise status of the work. Also, I need a detailed implementation plan (technical action and date) ".

Second, negotiating deadlines increased the project time-related complexity where different project members would have a conflict with proposed deadlines leaving deadlines to be ill-defined until reaching an agreement. The ops-contractor manager proposed to start the project on 22 Dec 2010 ignoring 7 Dec 2010 which was a deadline required by the project manager. The proposed start date was not accepted by the project manager who requested an immediate start of the project.

"From: Project Manager:

The date 22nd Dec is way too far to be acceptable. I would appreciate starting the activities immediately. "

Third, different dates were reported to the project manager but not as a detailed timeline or a well-defined deadline where instead of giving a timeline showing both start and end dates of tasks, the ops-contractor manager had only

given a start date for their tasks. Even this start date was given as an example and not as a firm date.

"From: Ops-contractor manager

*Activity will be started after Hajj holidays. ...
The plan will be to implement change after Hajj
freeze period i.e. 22nd Dec 2010."*

Fourth, a conditional deadline could be shared which was dependent on completion of other tasks. As an example, the ops-contractor engineer sent his update specifying dates for moving the project to testing stage. However, he had made those dates dependent on the ability to resolve project technical problems:

"From: Ops-contractor engineer

*Pending activities are as: Integration testing of
staging employee portal integration with SiteMinder.*

*We are planning to give a demo of staging employee
portal on Monday, 24th Jan 11 OR on Tuesday, 25th Jan
11 subject to the following dependencies are
resolved immediately by tomorrow 1st half. After
that we can confirm on production integration and
roll-out dates."*

Fifth, setting deadlines could be communicated verbally avoiding officially committing to a specific date. The ops-contractor would reply verbally to some project manager's requests of deadline. The project manager was contacted by phone by the ops-contractor manager in reply to his email setting a start date. The ops-contractor manager was going to leave to India and another manager

would take his place. The project managers realised that those verbal deadlines was a way to escape committing to an official deadline:

Project Manager: *the guy is leaving.*

Researcher: *Do you mean the ops-contractor manager?*

Project Manager: *Yes, don't you notice that he does not reply officially. He does not answer emails. He only replies verbally in face-to-face or over phone."*

Finally, the ops-contractor manager stopped reporting deadlines. They had just reported that their assigned tasks were completed. That eliminated the need to define a deadline.

"From: Ops-contractor manager

Our team have completed the set up in testing environment. We need to quickly review and finalise it to enable us to replicate the same in production. Also understand that the call is pending to close it."

However, the ops-contractor claims of completing their tasks were found wrong and false when tested.

Project Manager: *The Ops-contractor came to me on Wednesday saying that they have finished implementing on staging asking me to test ... When I try the website I get session timeout ... Later, it works ... Then, I get access denied message ... Actually, I am not confident. I feel that they are making things just to pass the test and then they will say that's it.*

In summary, the project suffered from increasing time-related complexities resulting from time pressures from outer context and the failure of the ops-contractor to specify a well-defined deadline within the project context.

7.3.2 Interactions with surrounding context

7.3.2.1 The relationship between the contractor and project members

Operations services were completely outsourced. An international Indian IT services jointly with a Saudi company had won the bid of managing the organisation operational services. That included desktop and network services management including security services.

Project members used to call ops-contractor for hardware and software problems. Project members referred to ops-contractor on daily basis for resetting user-ids and forgotten passwords. At the same time, ops-contractor was responsible of managing the organisation's many networks which was scattered and difficult to navigate where every network had different user-ids and passwords. The ops-contractor had been given to responsibility to implement a central Single-Sign-On (SSO) solution. SSO was made to allow users to authenticate once, then, they will move from a system to another without the need to be challenged to authenticate again.

Although, ops-contractor did not have much history with project members, project members mistrusted ops-contractor. Project members associated ops-

contractor to the outsourcing program and getting rid of employees. Project members did not know about the ops-contractor contract duration assuming that the ops-contract was there to stay doubting any improvements or changes in the relationship.

Researcher: *How long is left for the ops-contractor?*

System Manager: *that is if they are leaving.*

Researcher: *I am asking about the current contract?*

System Manager: *Even though, I don't know.*

Meanwhile, the number of the ops-contractor employees in the building was huge and the number of the Saudi employees was decreasing which was teasing the employees.

"Senior Developer: *The building has turned to be an Indian colony."*

It was perceived that the ops-contractor had gone so far changing and controlling the changes in the IT systems. It was assumed that the ops-contractor had the freedom to do anything with no supervision or follow-ups.

"Senior Developer: *Ops-contractor members do whatever they want, and say that this is the policy."*

One of the senior management told the researcher:

"Senior Manager: *I offered the VP to cover his expenses of a full week holiday, in one condition, to return and put pressure on the ops-contractor."*

Communication with the ops-contractor was normally via Help Desk system. Requests were either processed or rejected with a written reason. In both cases, the request used to be slow and take a time to be looked at compared to the old relation between old outsourced departments and project members which was dependent on personal relationships between IT employees.

The ops-contractor employees were not building any personal relations with old IT employees. Ops-contractor employees used to come to work in groups and leave in groups. In working breaks, they were hanging together. Rarely, two from the ops-contractor and the project members were witnessed together.

One of the ops-contractor managers said that before joining the workplace in Saudi Arabia, Ops-contractor employees had received training courses to help them accommodate with the Saudi culture. In their training, they had been told that Saudi employees did not to like arguing the matter which was eliminating the socialisation between the two groups to avoid conflicts.

In summary, ops-contractors were new in the IT and came as a result of outsourcing program. They turned business tasks, which were benefiting from the personal relationship between IT employees, into an official relationship which was only established through help desk system. IT employees mistrusted ops-contractor and viewed them to be changing the environment without supervision or follow-up.

7.3.2.2 The relationship between the Data security and project members

Data Security (DS) department role was to look after security policies. The department was responsible for enacting the policy and following up its implementation during systems development. Development departments were responsible for security implementation in their development projects. Those designs and implementation had to seek an approval from the DS. Later, DS had approved and adapted a Single-Sign-On (SSO) policy. To implement SSO, security layer removed from development products and moved to be implemented as a central layer. That was done in a joint project between development groups and the ops-contractor.

DS used to regulate all security-related issues of development projects. The past relationship between the two departments was tensioned. Project members perceived DS as limiting and constraining their development options by being so conservative.

***"Senior Developer:** DS used to be very tough. They were very cautious about making any changes. I used to tell [the DS manager] that it was better to disconnect our systems from the outside world to be assured that we are not hacked and security is not compromised. But work would not be done. They needed to consider the work needs. At the end, we need to be reasonable and balance between the two [security and productivity]".*

***"Another Employee (Complaining):** DS manager argues that wireless technology is not well-secured. Can you believe it?"*

DS manager viewed his department role to secure the organisation systems. He was worried about the organisation security especially from internal networks and through employees' machines.

"DS manager: I'm not worried from hacks or attacks from outside. I'm worried more from local machines. Every day, those machines are getting connected to several unknown networks then they join our network spreading viruses inside the network. ...If I have enough manpower I would check developers' codes line by line. This is my job."

Project members had a long relationship with DS and were familiar with what requests were regularly approved. Those requests were made through Help Desk system involving raising a request. Requests were reviewed and processed by DS members.

DS used to refer to a security policy regulating however that policy was not shared and DS manager used to negotiate security issues with each project members individually. DS was approached in two stages during projects. First, it was approached in the beginning of the project to approve the design and then before the end of the project to approve implementing changes to production environment.

First, obtaining the approval on the design was the very difficult part of the process. Based on achieving that approval, the second stage of requesting the changes would be easier. The first approval needed face-to-face meeting with

the DS manager and explaining the security requirement to him. He would accept, reject or request changes to the design.

Normally, convincing the DS manager with the security requirements was a difficult task. It used to reference the current practices. Requesting new access would be a challenge. When reaching a deadlock, the issue would be referred to the senior management to take a decision and according to DS manager "to take the responsibility".

Second, requesting the implementation of the agreed upon security changes, would only require referencing to the previous agreement which was normally a verbal commitment. Most of the time, developers knew what the DS manager would not approve and they used to know the workaround solution which he would be recommended.

7.3.2.3 The relationship between the tech-contractor and project members

The ops-contractor was not the only company which had an outsourcing contract in the IT. Another contractor (tech-contractor) had won a contract to outsource some IT technical services helping WDG in Portal configuration, administration and support. The tech-contractor worked with the project members in designing and developing a new environment as well as supporting the existing environment.

The tech-contractor consisted of two developers working with the project members and reporting to the project manager. They shared the workplace with project members where exchanging information and instructions were mainly communicated in face-to-face meetings.

The tech-contractor employees showed a great respect to the project manager. The project manager did not know the details of the contract which regulated the relationship with the tech-contractor. However, the project manager had to sign one of the papers during the process of the Tech-contractor payment.

"Project Manager: I did not see that agreement. All what I have to do is to sign a paper on a monthly basis stating the working hours of their employees who works with us. All what I have is this. This is the SoW (Scope of Work) written by the Polish (old contractor). The tech-contractor changed the cover page to put their logo and name. Even though, this is not the final version. You can see many corrections made by pencil all over the document."

7.4 Part Three: a Structural Analysis

7.4.1 Project structuration

7.4.1.1 Time-related complexity

As explained previously, the project suffered from an increasing time-related complexity. It was a result of time pressure exerted over project from external

context and failure to have an agreement on a well-defined deadline. On the other side, the project was not challenged by structural complexity or technical and technological complexity where the project had well-defined goals and tools from the project kick off meeting.

However, over the project lifecycle, the project was not static where project properties dynamically changed from time to time due to project members' activities to manage project time-related complexity. At the same time, the project was subject to changes because of the interactions with the surrounding context.

First, events and incidents could be non-organisational such as national disasters. The city of Jeddah, where the IT was located, was flooded. This led to delays in project deadlines and required an assessment of possible damages to the implementation due to the IT shutdown.

*"From: Ops-contractor engineer,
Due to floods in Jeddah on Wed 26th Jan, the entire
Data Centre and staging servers were powered off. It
was UP yesterday. We will be having one to one
session with [on-site Ops-contractor team] ... before
giving the final demo."*

Second, the project was pressured by senior management. The project had taken too long time. Therefore, the VP recommended the project manager to end the project if not delivered by a specific deadline. The VP recommendation gave the deadline the form of being a regulating property constraining project

activities. This recommendation was not only delivered to the project manager rather it was shared with the GM who followed up on the project status. The GM checked with the researcher and not with the project manager to know if the project manager applied the recommendation or not. The project manager knew that his action to continue the project or not was monitored by the GM.

***"Researcher:** The GM called me asking about the meeting with the ops-Contractor. I told him that we have seen the demo.*

***Project Manager:** he wants to know if we are still working with the ops-contractor or not?"*

7.4.1.2 Structural Complexity

As introduced previously, the project started with two sets of goals to choose from. The first goal involved building a limited security solution while the second goal was to build a full security solution. It was assumed that project members had reached an agreement on choosing the second solution in the project kick off meeting.

The agreement on the project goals was assumed to form a shared signification of project goals. However, the old goals did not disappear and continued to be centre of negotiation and compromise through project lifecycle where they went back to appear again when the first conference call was made between the project manager and the ops-contractor engineer. In the conference call, the ops-contractor engineer presented the tasks performed by his team. It was

obvious that the ops-contractor had implemented the first solution rather than the second agreed upon solution. The ops-contractor introduced the solution for testing and approval of the project team. At the same time, the ops-contractor stated that he was in the process of applying for a visa to visit Saudi Arabia to implement the solution if it was accepted by the project manager. The project manager commented on the offered solution considering the acceptance of the limited solution:

***"Project Manager:** So, we [secure resources] in portal and tell them (ops-contractor) to do the same in the [their solution]. Another thing, resources in the backend are open unless they secure them ... the opposite way... if (the ops-contractor engineer) arrives quickly (to Saudi Arabia). Mmmm if they finish this task properly ... I think that the solution is acceptable."*

The project manager was chased by the GM and VP who asked him to end the project if the goals were not achieved. Being pressured by time and senior management, the project manager found that he might accept the first solution to end the project, compromising some features of the second solution. The project manager acceptance was not passed to the ops-contractor where he needed to test the implementation first. Meanwhile, he was waiting for the arrival of the ops-contractor engineer.

The pressure of the senior management continued. The GM wanted to know the outcome of the meeting:

At the same day and after working hours, GM called me and not Project Manager to ask about the meeting with the ops-Contractor. When, I met Project Manager, next day, I told him about that call.

Researcher (to project manager): *He asked about the meeting outcome. I replied that we have seen the product and someone is coming from their side and they will have a look into moving to production. He said "so, it needs 40 or 50 more days" I replied that I don't know. That is what happened that day.*

Project Manager: *he wants to know if we are still working with the ops-contractor or not?"*

Due to the pressure of the senior management and the failure of the ops-contractor to deliver a solution, the project manager decided that he was not confident with the given solution and wanted to end the project.

"Project Manager: *the ops-contractor came to me on Wednesday saying that they have finished implementing on staging asking me to test ... When I enter I get session timeout ... Later it works ... after a while, I receive a message saying access denied ... Actually, I am not confident with their solution. I feel that they have just made things to pass the test and then they will say that's it.*

... I am not convinced with their solution but I need to build this on some real basis. I cannot just reject it ... yesterday, they forgot a server because of the cluster. Once, it gives a response and later it gives another one ... they insist on coming daily after 3:30 ... when I am alone."

To end the project, the project manager asked for the second solution. However, the ops-contractor claimed that the second solution was not achievable due to technical limitations.

In summary, the project goals were split between two sets of goals and two significations. Despite the agreement on the beginning of the project on the project goals signification, that was not evident in later activities where the ops-contractor acted upon the first project goals signification (limited solution) while the project manager built upon the second project goals signification expecting a full solution. Due to the pressure exercised by senior managers to end the project on-time, setting deadline as a constraining property regulating project activities, the project manager was ready to accept the first signification to meet the deadline. When, meeting the deadline was not possible, since the failure of the presented solution, the project manager reverted back to adapt the second signification and blame the ops-contractor for not implementing it.

7.4.1.3 Technical and technological complexity

Project methods were highly connected with the project goals. The project could be implemented using one of two components from the CA-SiteMinder solution. SiteMinder plug-in would help in introducing a limited solution while SiteMinder Web Access Manager would help in achieving a full security solution. That was claimed in the ops-contractor manager's first meeting with the project manager. According to the ops-contractor manager choosing the goal meant choosing the tool and vice versa. Therefore, the project had reached an agreement to implement the full security solution using the suitable tool. Accordingly, the agreement on project goals and shaping a shared common

project goals signification led to forming a shared common signification about project technology.

However, the ops-contractor engineer introduced the first limited security solution. When, the ops-contractor engineer was asked about the reason behind not implementing the full security solution and not using SiteMinder Web Access Manager, the ops-contractor confirmed that he used the mentioned tool. He added that the full security solution was not technically possible even using that tool. The project manager did not accept that claim. Therefore, the two parties agreed to write to the tool vendor support asking about the technical possibility of the solution. The two parties agreed on a technical problem statement to be raised to the vendor support team which was asking about the possibility of doing the missing feature:

"From: Ops-contractor

To: Project Manager

Please find below the problem statement of the following business requirement:

- Business requirement: Dynamic tab/link in the portal should be controlled/restricted by SiteMinder*
- Problem statement: Dynamic tab/link in the portal can't be controlled/restricted by SiteMinder."*

The vendor's reply confirmed the possibility of the full security solution. At that time, the project manager decided not to compromise any goals and asked for

immediate delivery of the full security solution which entailed the use of SiteMinder Web Access Manager.

The owner of the technical knowledge contributed most in shaping project technological signification. The technical knowledge was not regulated and the project members required regulating it especially when it leads to a change in project goals signification. Therefore, he called technology vendor to verify the given information.

7.4.1.4 Organisational complexity

As introduced previously the project was supposed to be performed jointly by WDG developers, tech-contractor and ops-contractor. Meanwhile, the project required the involvement of GM Development and DS manager. The project was seen to involve different groups with different specialities and each group members were reporting to different manager. WDG developers and tech-contractor engineers reported to the project manager while the ops-contractor engineers were reporting to the ops-contractor manager. The work of ops-contractor was supervised by the DS manager while the work of the project manager was monitored by GM Development and the VP. That was adding to project organisational complexity.

The project organisational complexity required a longer follow up process where obtaining information from the ops-contractor took longer time than

obtaining information from developers and tech-contractor engineers. On the other side, ops-contractor found that obtaining information from developers and tech-contractors was taking longer time. When information is required the request should be given to the group manager who would redirect it to his group members and then reply with the required information. Even, when the group members were approached directly, they would need to go back to their manager to get his approval to give information to other members. Accordingly, organisational complexity was observed to increase the project time-related complexity.

The ops-contractor tried to simplify organisational complexity by requesting some members to work directly with them. Those members should be able to cooperate and exchange information with ops-contractor without referring to project manager.

"From: Ops-contractor Manager,

... The timeline should start from 14th of Dec. Pls. do assign a dedicated single point of contact so that we can start interacting with him."

The project manager replied assigning two developers to communicate with ops-contractor directly. That was assumed to solve ops-contractor delay in receiving information. However, that attempt to simplify organisational and time-related complexities did not succeed for two reasons. First, the two assigned contacts did not cover all missing specialities. The two contacts were

developers with no enough experiences in Portal configuration and administration. Portal experiences were available to tech-contractor members. Accordingly, ops-contractor would need to communicate with the two developers who would obtain information from tech-contractor and forward them to ops-contractor. Second, the failure in starting the activities on the specified date on 14 Dec hindered the change in the project organisational structure and called for the involvement of the project manager.

"Developer: No one (from ops-contractor) has contacted me yet ... [the Project Manager] sent them an e-mail asking why they have not started as it was promised in their plan to start on 14th of December."

Accordingly, the ops-contractor's approach to simplify project organisational complexity was hindered by the failure to address project organisational complexity resulting from the number of specialities in the project.

Later, ops-contractor managed to launch an unofficial direct communication with tech-contractor away from the project manager to address the missing specialities. However, the project manager did not approve the relationship and worked on stopping it.

"One week later on 21st of December 2010, Tech-contractor employee sent an e-mail to the new ops-Contractor engineer responsible for the implementation of the security layer describing the current Employee Portal environment giving details about used softwares."

Next day, a junior developer commented on the tech-contractor employee's email saying "He replied to those questions without consulting the project manager. The Project Manager is very angry".

This added to project organisational complexity where the project manager found that he should monitor the communication between the two contractors and make sure that they were only communicating through him.

"Project Manager: *The other day, I found [the tech-contractor expert] having a conference call with [the ops-contractor engineer] in India. I asked him not to communicate with them directly. At the same time, I told ops-contractor to only communicate with me. Since then, we had no more contacts."*

From the other side, time-related complexities continued to delay project and to affect other project complexities. Project delays had subjected the project to changes in organisational structure. Prior to the project kick off, GM Development was planning to transfer Portal administration tasks from WDG to another department. He considered that task not to be part of development team responsibilities and it should be given to the newly established middleware support group.

"Project Manager: *The GM does not want it [Portal administration] ... He does not want us to work on the middleware. He says that we should only be concerned with development of business code."*

However, the middleware support group was still under establishment and giving Portal administration to them was going to delay the implementation of Employee Portal project. Later, because of the project delay, the middleware

group was ready to handle Portal administration. The middleware group manager agreed with the senior manager to take the responsibilities of Portal administration as well as to move the tech-contractor experts to work under the supervision of the middleware group manager.

Project Manager: *Now they (senior management) made [a middleware group] to support the environment and the first request they have made is that Tech-contractor should join them.*

The project delay had subjected the project to the change in the surrounding organisational structure increasing project organisational complexity where the newly established middleware group was added to the project. At the same time, tech-contractor moved to report to the middleware group manager. According to the new structure, the project manager needed to contact the middleware group manager to communicate with the tech-contractor.

Organisational complexity was increased by the project groups' hierarchical structure where the manager of each group would regulate the communication between his group and other project groups. Violating this regulating mechanism was not accepted by managers and led to mistrust and extra work to monitor communications closely. Meanwhile, the nature of this regulating mechanism was time consuming and adding to project time-related complexity. On the other side, the delay in project implementation subjected project to changes in surrounding organisational structure where the changes in the surrounding regulating processes extended to affect project regulation.

7.4.2 Organisational context undermining project context

7.4.2.1 Contractor undermining deadline and goals

The ops-contractor played a role in undermining project context. In the project kick off meeting, an agreement had been reached on the project goals and ops-contractor was asked to share their tasks list including the deadline of each task. However, the ops-contractor undermined defined tasks and deadlines.

The project manager's requests to have a specific deadline were undermined by the ops-contractor. First, ops-contractor ignored responding to project manager's emails. Second, they opened deadlines for negotiation and did not set a specific agreed upon deadline. Third, ops-contractor offered uncertain deadlines. Finally, they ended up announcing the completion of their tasks but that was seen to be false when the system was tested by tech-contractor and WDG developers.

Meanwhile, the project manager's requested deadline, which was the deadline of the previous dependent project, was ignored by the ops-contractor manager who specified a project start date after the required deadline.

On the other side, the agreement on project goals was undermined by the ops-contractor. That was realised in the conference call with the ops-contractor engineer. During the call, the engineer introduced the solution which was found to be a limited security solution. Later, the ops-contractor confirmed that the

given solution was limited referring the limitation to a limitation in the used security tool. That undermined the previously obtained knowledge from the ops-contractor who claimed that the used tool was able to offer a full security solution. At the same time, it was undermining the agreed upon goals.

In brief, the ops-contractor started by agreeing to project goal signification but did not agree on deadlines signification. Ops-contractor managed to ignore all requests to share deadlines signification with no success. The project manager did not have the power to regulate ops-contractor activities. Later, the project manager found out that the ops-contractor had changed project goal signification and that tasks were informed by the not agreed upon goals signification.

7.4.2.2 Senior management undermining project structure

Since the start of the project, GM Development was realising the need to move Portal Administration tasks to another department. The GM viewed Portal Administration as part of middleware support tasks. Therefore, he wanted to remove those tasks from his departments and to be only concerned with development tasks. That was not applicable because Portal technology was new on the IT and did not have a department to support it.

***"Project Manager:** The GM does not want it [Portal administration] ... He does not want us to work on the middleware. He says that we should only be concerned with development of business code."*

When, the project started, IT was establishing a new department to support Portal and web technologies middleware. The department was still under construction where all its members were involved in an extensive training program. Because the middleware support department was not ready at the time of the Portal Security project start, the GM agreed to support the project start by WDG.

The portal security project had started and was expected to end before the readiness of the new middleware support department. However, the project did not finish within expected times and it was not known when the project was going to end. Moreover, the GM was asking the project manager to end the project claiming that the project would continue for a long time suffering from delays. The GM doubted the ability of the ops-contractor and the project manager to end the project sooner.

When the middleware support group finished their training program and were ready to accept work, GM Development agreed with the middleware support manager to move all Portal administration to the new department. Part of that agreement, the GM accepted to move the tech-contractor to work under the supervision of the middleware manager instead of the project manager.

***"Project Manager:** Now they (senior management) made [a middleware group] to support the environment and the first request they have made is that Tech-contractor should join them."*

The change in the IT organisational departments had left an effect on the project. First, any changes to the environment were expected to be discussed with the middleware manager. Second, the tech-contractor members were not reporting to the project manager and any request should go through the middleware support manager. The GM agreement with the middleware manager undermined the project internal organisational structure increasing the number of groups involved in the project and increased the depth of the hierarchy between WDG members and tech-contractor members the matter which increased project organisational complexity.

The change in organisational structural hierarchy including changes in authorities and regulating roles resulted in a change in project organisational hierarchy and regulating roles. Meantime, these changes propagated to project context after the approval of senior managers.

7.4.3 Responding to organisational context

As introduced previously, the project was affected by both ops-contractor and senior management actions. The ops-contractor undermined the project need to have a shared common signification represented in well-defined deadlines, project goal and technology. On the other side, senior management had approved an organisational change which resulted in an increase in organisational complexity adding a new group to the project and moving tech-

contractor from directly reporting to the project manager to work under the supervision of the newly established middleware group.

7.4.3.1 Referring to Data Security manager

Responding to the ops-contractor undermining project local activities, the project manager referred to the DS manager to put a pressure on ops-contractor and to regulate their activities. The project manager referred to the DS manager since he was involved from the beginning and both the need for a well-defined deadline and project goals were officially included in the DS manager email next to the kick off meeting.

"...The second approach is to install the SiteMinder Web Access Manager (similar to TAM) which the ops-contractor needs to acquire and purchases."

The referral to the DS manager in project interactions showed an effect on ops-contractor actions. When the DS manager was referred to by the project manager his involvement would take the shape of a strict regulator where he would be commanding ops-contractor and in some cases threatening them with escalating issues to senior management.

"From: DS Manager

To: Ops-contractor manager

I was following-up with you on this subject since SAT 4th DEC to ensure concerned area reply and update activity status as agreed with Mr. ... [previous ops-contractor's manager] on 4th November and till now we didn't receive any update. Therefore

this matter will be escalated to upper management if we did not receive the plan by today."

The DS manager continued following-up with the project manager to assure his satisfaction and receive his confirmation on producing the project goals.

"From: DS Manager

To: Project Manager

As per our discussion and based on the update given by the ops-contractor to you today in your office, we will wait for your final confirmation prior giving confirmation on SSO deployment in the new Employee portal."

The referral to the DS manager had 'empowered' the project manager and pushed the ops-contractor to stop ignoring project manager's communicative actions represented in number of emails requesting status and a well-defined deadline to create shared project signification. However, this empowerment and regulating role did not help the project to specify a deadline where the ops-contractor changed to announce goals completion which proved to be false after testing.

At that time, the DS manager realised that he was not able to put more pressure on the ops-contractor realising that his regulating role was limited therefore an escalation to IT senior manager was required. The DS manager did not hesitate to call the senior management to meet and discuss project problems. However this call was not answered by senior managers and required regulating role was not obtained in project context.

"From: DS Manager

To: Project Manager

"From my side, ... As you can see today meeting was to finalise this subject; but both GMs were not able to attend this meeting. Therefore I had to cancel the meeting and we will reschedule it soon."

7.4.3.2 Referring to senior management

Project members expressed a need for the involvement of senior management to perform a regulating role in the project context. They mistrusted the ops-contractor and assumed that they were playing tricks manipulating project activities. They did not recognise any IT group to stop ops-contractor's tricks other than referring to IT senior management. Senior managers were perceived to be powerful in their interactions with ops-contractor.

***"Senior Developer:** the ops-contractor needs a powerful guy from senior management to stop them".*

However, the project manager showed reluctance to directly and continuously referring to senior management. The project manager claimed that he could not refer to the GM because he was busy.

***Researcher:** "Why don't you get back to the GM with the current situation?"*

***Project Manager:** Today, I will email him explaining the situation.*

Later the project manager said that he did not send the email because he was busy.

The project manager did not refer to senior management until late in the project. The project manager referred to the VP who did not put a pressure on ops-contractor but recommended the project manager to terminate the project.

***"Project Manager:** I talked to the VP who told me to give them till end of this week and if they did not come back, that's it."*

The referral to senior management was needed as an 'empowerment' to project manager where senior managers were expected to put pressure on ops-contractor regulating their actions and forcing them to specify a well-defined deadline and to commit to developing the full security solution. Senior management as regulating party was expected to bring ops-contractor to adapt project members project goals signification and to generate shared deadline signification which empower project members to regulate ops-contractor activities without referring again to senior management. However, senior management did not empower the project manager and only gave him a recommendation to terminate the project which was an emphasis on regulating the project not the ops-contractor leaving the regulation of the ops-contractor to be the responsibility of the project manager.

In front of the ops-contractor attitude which was undermining project deadlines and goals, the project manager had tried to communicate with the DS manager and senior management to empower his position in the project context and to put pressure on ops-contractor to cooperate. However, all empowerment

attempts did not help in readjusting the project and reaching a successful end.

All empowerment attempts were sanctioned by the recommendation to terminate the project.

The project manager realised the failure in being empowered by his relationships with the DS manager and IT senior managers. Therefore when the ops-contractor introduced a limited solution the project manager was ready to accept it. Although the solution was not the agreed upon solution in the project kick off meeting, the project manager considered it satisfactory. What the project manager wanted at that time was to finalise the project as soon as possible with the minimum acceptable quality. He was ready to change his project signification to meet senior managers' deadline.

***"Project Manager:** If this guy (the ops-contractor engineer) comes quickly. If they deliver what they have promised to do properly ... I think that the solution is acceptable."*

That was an act of 're-skill' where the project manager accepted ops-contractor' signification of project goals to end the project successfully within the time constraints set by senior management. The project could end successfully following the limited project signification however the ops-contractor could not deliver the product on-time.

7.4.4 Reflexive monitoring

7.4.4.1 Team members challenges

Project learning is hindered by underestimating project and ignoring the contribution of project members (Williams 2003) where project success requires generating learning knowledge by all team members (Lindkvist et al. 2002).

WDG developers were part of the design and implementation of the previous Employee Portal project. They built the applications running on the Employee Portal environment. It was assumed that any changes to Portal security might require changes to the developed applications. Therefore, they were part of the project. Meanwhile, WDG developers did not have enough information about project activities where the project manager did not share the project progress with them. Project members were not helped to populate their signification of the project and depended on the project manager signification. They acted upon the available information and did what they were asked to do by the project manager the matter which limited their contributions to the project and to reflecting on project signification.

***"Junior Developer:** No one has contacted me yet. The project manager told me to work with them on this project. That's all what I know about it."*

Although, little information was shared within the project context, developers were obtaining other information about ops-contractor from the organisational context. Based on the available information, WDG developers expressed their mistrust in the ops-contractor. The developers claimed that the ops-contractor was not acting properly and a junior developer expressed worries that the change of the ops-contractor manager would waste project time affecting all previous tasks and agreements.

*"**Junior Developer:** Are we going to repeat the whole process with ops-Contractor's new manager!"*

Similarly, the senior developer assumed that ops-contractor were playing tricks with the project manager calling for senior management's support.

*"**Senior Developer:** the ops-Contractor needs a powerful guy from senior management to stop them".*

Developers were not sharing their opinions with the project manager where shared information was assumed to be ignored by the project manager.

On the other hand, the tech-contractor experts were part of the project team. They were reporting directly to the project manager who assumed that they would only exchange information with him and no communications would be established with the ops-contractor without his knowledge. However, tech-contractor expert were found to leak project team and environment information to the ops-contractor without referring to the project manager.

"Project Manager: *I found [tech-contractor expert] having a conference call with ops-contractor engineer. I asked him not to communicate with them directly. At the same time, I told ops-Contractor to only communicate with me. Since then, we had no more contacts."*

On the other hand, the project was affected by ops-contractor members rotation from time to time and during project activities. Right after the project kick off and after the agreement on project goals and methods, the ops-contractor manager was changed. That limited the ability of the project manager to obtain information from ops-contractor where the old ops-contractor did not want to exchange any information officially leaving that to the new manager. The project manager needed to wait for the arrival of the new manager to receive any required information.

Later, the ops-contractor engineer who was working on security had a serious health problem and was replaced by another engineer

"From: Ops-contractor manager,

My apologies for the delay, it's because the earlier engineer identified for this project (Mr. ... , the one who had installed the SiteMinder at IT) got hospitalised due to some acute health issues. We now have a new team of engineers (Mr. ..., based out of India working along with Mr. ..., based at IT Building)."

Changing project members was not limited to ops-contractor where the IT had introduced a new department responsible for Portal administration and moved the tech-contractor group to work under the supervision of the newly

established department. That was seen to allow new members from the new department to participate in the project. The project manager assumed that those members did not have enough experiences to take that responsibility.

***"Project Manager:** It takes time in my opinion to build confidence and experiences to work on the environment that is besides training. Is it applicable to bring someone who has not ever heard about Portal and give him the responsibility to manage it? That's what they are doing.*

In summary, exchanging information within the project was affected by project members. It was affected by underestimating members' contribution to the project by not sharing project information with them and eventually limiting their abilities to participate in generating project signification. At the same time, members' rotation limited the exchange of information between project members and did not allow the population of shared signification.

7.4.4.2 Organisational challenges

As shown previously, the attendance of the GM was important to facilitate the project kick off meeting despite the fact that the GM was not participating in the discussion where, since the beginning of the meeting, the GM was only listening to all talks and discussions without joining them.

Later, during project activities, the GM was not noticed to support the project team. Senior management support was assumed to be needed while dealing with the ops-contractor. Project members knew the problems which might face

the project which was mainly due to the difficulties in dealing with the ops-contractor.

***"Senior Developer:** the ops-Contractor needs a powerful guy from senior management to stop them".*

However, the senior management stayed away from the project and did not participate in a direct way. Even when the VP was approached to support the project team regulating the ops-contractor's activities he turned to regulate the project continuation and recommended the team to terminate the project if they were not receiving the required product on-time.

***"Project Manager:** I talked to the VP who told me to give them till end of this week and if they did not come back, that's it."*

The GM distanced himself from the project. Even, when he needed to receive a feedback about the project status, he did not approach the project manager or anyone from the project team rather the GM called the researcher and asked him about the project status.

"At the same day and after working hours, GM called me and not Project Manager to ask about the meeting with the ops-contractor. When, I met Project Manager, next day, I told him about that call."

***Researcher** (to project manager): He asked about the meeting outcome. I replied that we have seen the product and someone is coming from their side and they will have a look into moving to production. He said "so, it needs 40 or 50 more days" I replied that I don't know. That is what happened that day.*

Project Manager: he wants to know if we continue with the ops-contractor or not?"

The GM expressed his mistrust in the project including both the ops-contractor and the project manager.

"Then, the GM asked about the project's work

***GM:** if it is not working, stop it.*

***Project Manager:** We doubt them.*

***GM:** Actually, I doubt you and them."*

The main organisational support in this project was received from the Data Security manager. The DS manager was supervising the ops-contractor work and was part of the process of supervising ops-contractor's work, approving payment and penalising them.

The DS manager helped in calling for the project kick off meeting inviting all related parties for a meeting in his office including the GM. The attendance of all parties including both the GM and the DS manager was very important to start the project and helped in getting an approval on kicking off the project.

The presence of the DS manager in project interactions showed an effect on ops-contractor actions. This was observed firstly in the project kick off meeting where before the meeting, the ops-contractor manager reported the need to buy the security tool license:

"...The second approach is to install the SiteMinder Web Access Manager (similar to TAM) which the ops-contractor needs to acquire and purchases."

In the meeting, [the ops-contractor manager] declared that all the project manager's requirements can be fulfilled and that the organisation had already had the required security tool license. The project manager commented on this change saying:

*"**Project Manager:** He (Ops-contractor' manager) wanted to fool us. Did you see him when [the DS manager] asked him about the availability of the tool? He couldn't lie about it."*

On the other hand, the project manager suffered from the delays in responding to his emails by the ops-contractor. The ops-contractor was not replying to project manager's requests. They did not give the required information. The project manager kept asking for a list of tasks and deadlines but his emails were ignored and the requested information was not given. Therefore, the project manager referred to the DS manager to help in obtaining the required information. The DS manager supported the project manager following up and putting pressure on the ops-contractor to give the requested information.

"From: DS Manager:

To: Ops-contractor manager

I was following-up with you on this subject since SAT 4th DEC to ensure concerned area reply and update activity status as agreed with the [previous Ops-contractor manager] on 4th November and till now

we didn't receive any update. Therefore this matter will be escalated to upper management if we did not receive the plan by today."

It proved that DS manager was able to put pressure on the ops-contractor and regulate their behaviour. The ops-contractor manager immediately responded to the DS manager's email explaining the reasons behind the delay:

"From: Ops-contractor manager

To: DS Manager:

My apologies for the delay, it's because the earlier engineer identified for this project (Mr. ... , the one who had installed the SiteMinder at IT) got hospitalised due to some acute health issues. We now have a new team of engineers (Mr. ... [Ops-contractor engineer], based in India working along with Mr. ... , based at IT Building) working on this task now. We'll have the activity list shared with you by tomorrow & a detailed project plan by mid of next week."

However, the DS manager regulating authority on ops-contractor was limited where he reached a stage that he was not able to regulate their actions and needed senior management support to extend his regulating authority on them, the support which was not obtained.

7.4.4.3 Content-type challenges

The Portal Security project was heavily relying on email. Email was used to exchange information officially. Before the project start, the project manager sent to the ops-contractor manager requesting his views about the project.

Those views were discussed in a meeting verbally. Therefore, the project manager sent an email to receive an official reply.

"From: Project Manager

To: ops-contractor manager

As we are still awaiting your findings - in official regarding the security issue with the new portal being implemented by [Tech-contractor], kindly advice your recommendations, options, pros & cons, timelines and any special considerations to secure the new portal environment."

Similarly, the Portal Security project was officially initiated by the meeting of the project team and ops-contractor in the presence of the DS manager and GM Development. The initiation was stated in the DS manager's email which assigned an action item on the ops-contractor to generate and share a timeline of their activities. The DS manager email announced the start of the project and requested the timeline officially.

"From: DS Manager

To: Ops-contractor manager

... all parties awaiting for a proposed timeline of SSO deployment in this setup."

Therefore, email was used as an official reply which was saved and could be retrieved and referred to later. When no official reply was needed to be communicated, members used verbal communications. Meanwhile, the project manager could realise when other members were trying not to give an official reply.

Project Manager: *the guy is leaving.*

Researcher: *Do you mean the Ops-contractor manager?*

Project Manager: *Yes, don't you notice that he does not reply officially. He does not answer emails. He only replies verbally face-to-face or over phone."*

The project might face some challenges when required information was not recorded in an official email. The project manager documented the project goals and specifications in an e-mail trying to generate shared project signification. However, the e-mail was ignored by the ops-contractor and was not officially approved. The ops-contractor manager was asked to reply with a detailed project goals and specifications but he did not. That resulted in conflicted project significations between the two project manager and the ops-contractor.

"From: Project Manager

We are trying to state what [the ops-contractor manager] approved in the last meeting which was not documented as the DS manager agrees that the ops-contractor manager had to send modified meeting minutes which he did not do. So kindly, go through the below minutes and update in RED colour what you believe was agreed by the ops-contractor manager."

Email was used to communicate with ops-contractor who were located in the IT building and who were working remotely from India. Official information could be exchanged via email. However, when there was a need to give unofficial information, it was given verbally. When, the VP asked the project manager to give the ops-contractor till end of the week to give their solution, the project manager wanted to tell the ops-contractor that he had the VP's support. The project manager wanted to make ops-contractor more interested in responding

to his requests. Therefore he sent the tech-contractor expert to tell the message verbally.

“Project Manager: *I talked to the VP who told me to give them till end of this week and if they did not come back, that’s it. So, I wrote them an email saying that if they did not come back by Wednesday they have to consider it over. They did not reply. Last Wednesday, I told the tech-contractor expert to talk to them and if they did not reply I would send him on Saturday an official email to change all servers’ passwords. It seems that he (the tech-contractor expert) talked to them because while I was checking my email I found an email from them on Thursday saying that they were sorry for not replying.”*

In summary, Email was used by project manager to regulate ops-contractor activities and to receive their approval on project signification. Meanwhile, ops-contractor avoided officially sharing project signification and tried to solely control the progress of project signification.

7.4.4.4 Spatial challenges

The project was affected by spatial challenges. The ops-contractor team, working in the IT building, were highly connected with their base in India. The employees were moving between the two locations. After the project kick-off, the ops-contractor left Saudi Arabia and returned to India. Ops-contractor members, who would leave, were not accessible anymore. They were using the organisation’s e-mail. Once, they would leave their emails were deleted. On the other hand, ops-contractor members involved some members who were based

in the IT building while other members were based in India. The ops-contractor engineer who was responsible for installing the solution was working remotely from India.

Working remotely resulted in some challenges. First, the ops-contractor engineer was not able to collect information easily. The engineer used to send an email to ask for information and when the answer was delayed the engineer would ask one of his team located in the IT to help in collecting the needed information in face-to-face meeting. Alternatively, the engineer had the chance to contact project members through conference calls.

The ops-contractor engineer explicitly referred to the difficulties of reaching stating that his replies by emails might be delayed due to technical issues. He redirected project members to contact ops-contractor manager who was locally based in the IT building.

*"From: Ops-contractor engineer
All, Please find the status report attached. Also,
Please, note that I am having limited access to
emails due to VPN connectivity which is why there
will be delay in replying. For any queries in
future, please contact [ops-contractor manager] for
immediate response."*

Both ops-contractor and project members faced problems in reaching a common project signification due to spatial issues. Due to staff rotation, project manager could not communicate in face-to-face with ops-contractor members.

On the other hand, ops-contractor engineers faced problems working remotely and needed local presence to collect technical information to help them define project signification.

7.4.4.5 Time-related challenges

The communication between the project manager and the ops-contractor engineer was affected by the weekend difference between Saudi Arabia and India. That delayed the interactions over e-mail between the two sides of the relationship.

*"From: Project Manager:
To: Ops-contractor engineer
Kindly advice status ... FYI, tomorrow is Wednesday which is the last working day in the week in our calendar. That means, if we miss it we will miss more four days until next Monday which means wasting more time."*

Emails were delayed by ops-contractor members limiting the project manager ability to collect information about the project. Meanwhile, the project manager was constrained by the deadline of the previous Employee Portal project. The deadline pressure pushed the project manager to ask for quicker answer to his emails.

On the other hand, the project was affected by the lengthy process of obtaining a visa to visit Saudi Arabia where the ops-contractor engineer needed to visit the IT building to implement his design to production environment.

Finally, ops-contractors members used to visit the project manager at the end of the working day. The project manager claimed that the ops-contractor members meant to meet him at that time because he used to be alone. He suspected that ops-contractor members wanted to put pressure on him and to push him to accept their proposed solution (signification).

***"Project Manager:** They insist on coming daily to my office after 3:30 ... when I am alone."*

In summary, the project was affected by temporal differences resulting from spatial settings including weekend and time differences between Saudi Arabia and India and the time which took ops-contractor members to move between the two locations. Meanwhile, the project was affected by ops-contractor ability to specify meeting times opposite to project manager who did not identify a permanent office location for ops-contractor members.

7.5 Conclusion

This chapter examines the Portal Security Project identifying the project internal complexities and illustrating the relationships between the project and the surrounding context.

From the kick off stage, the project had a well-defined goals signification represented in producing a full security solution for the Employee Portal. This signification was conflicted by the ops-contractor's signification of project goals

which was influenced by their interest in avoiding any payment deductions. Meanwhile, the project technology and methodology signification was tightly linked with project goals signification. Moreover, the adaptation of the chosen technology required the integration between Portal and Security technology which added to the project technical and technological complexities. The project was subject to an increasing organisational complexity resulting from the increasing number of groups and specialities participating in the project as well as from the interdependencies between various groups. At the same time, the project suffered from time-related complexities resulting from time pressures from another project and the failure to reach an agreement on a well-defined deadline within the project context.

The ops-contractor members were mainly communicating officially with the organisational departments where the relationship between the two parties suffered from mistrust. IT employees accused ops-contractor with working away from internal supervision and follow-ups referring to DS manager who was supposed to play the role of regulating the work of ops-contractor.

The project was expected to handle both project internal complexities and external relationships with external groups. Project members were aware of the project context and its relationship with the surrounding context and their actions were informed by their knowledgeability.

The project was subject to time pressures during project lifecycle due to non-organisational events such as the city flood. At the same time, the project was subject to an increasing time pressures exerted by IT senior management. As a result of the increasing time pressures, the project signification of goals and methodology were subject to changes where the project manager expressed a tendency to accept a limited security solution. However, that acceptance was changed later when the project manager insisted to have the agreed upon full security solution. At the same time, project delays subjected the project to changes in the outer organisational structure where the middleware support group was established. The new group was introduced to participate in the project and the tech-contractor was transferred to report to them instead of reporting to the project manager.

On the other side, the project was not isolated from the surrounding context where the project context was undermined by the contractor and IT senior management actions. First, the ops-contractor undermined the kick off meeting action item where they did not supply the project manager with their timeline including a set of tasks and deadlines. At the same time, the ops-contractor undermined the dependency between the project and the previous Employee Portal project where they did not commit to deliver the project prior on the previous project cutover date. Finally, the ops-contractor undermined the agreement on project goals and introduced a limited security solution instead of

a full security solution. Similarly, IT senior management undermined project context where they established a new middleware support group.

Responding to the undermining actions from the ops-contractor and IT senior management, the project manager had taken different modes. First, the project manager looked for an empowerment from both DS manager and IT senior managers. The DS manager supported and empowered the project manager regulating the ops-contractor actions. The DS manager empowerment helped the project manager to receive replies from the ops-contractor but did not help in finalising the project successfully. On the other hand, IT senior managers did not empower the project manager but asked him to end the project. When, the project manager could not receive the needed empowerment from DS and IT senior management, he revert to accept the ops-contractor changes in project signification.

Finally, the project team knowledgeability with the internal and surrounding context was not assumed to be absolute and their ability to monitor the project was challenged by team members, organisational, content-type, spatial and time-related challenges. Those challenges limited project members' knowledgeability and affected their actions and responses to undermining actions. First, the project manager did allow other members to participate in shaping project signification. Second, the project was not supported by IT senior management to regulate ops-contractors actions rather the project manager

referred to the historical relationships with other organisational departments to obtain the regulating role. Third, project information was mainly exchanged over email which resulted in delays and difficulties in exchanging tacit experiences. Fourth, the project was hindered by spatial issues due to the remote participation of some of the ops-contractor's members and staff rotation. Finally, the project was hindered by weekend differences between Saudi Arabia and India. At the same time, the project was affected by the time of the meetings, the delays of emails replies and the lengthy process of obtaining a visa to Saudi Arabia.

Chapter Eight: The Paperless Correspondence Project

8 The Paperless Correspondence Project

8.1 Introduction

This chapter describes and analyses the Paperless Correspondence Project. The project involved the design and implementation of both a portal environment with a paperless IT correspondence workflow running on top of the portal platform. The project involved the interactions between the VP consultant, the portal and workflow technology vendor (tech-vendor) and one of the Tech-vendor's partners (tech-partner).

Similar to the previous two chapters, this chapter is divided into three parts. The first part presents a chronological description of project main events. The second part describes a snap shot view to project complexity and the surrounding non-project context. Finally, the third part uses structuration theory to understand project activities the changes and dynamics of project complexity and relation with the surrounding context across time and space.

The first part outlines the story of the Paperless Correspondences Project. The story is chronologically illustrated from initiation to termination highlighting the main events occurring during project lifecycle.

The second part highlights the challenges facing the project due to internal project complexities and external surrounding context. First, it explains project

complexity illustrating the four types of complexities: time-related, technical and technological, organisational and structural complexities. Second, it shows the relationships between the project context and the surrounding external non-project context describing the relationship between the VP IT consultant as a project manager and IT senior management. At the same time, it shows the relationship between the project and other organisational departments. Finally, it introduces the relationship between the vendor and organisation.

Finally, the third part adapts structurational perspectives to analyse project activities. First, it shows the dynamics of project complexities showing their changes over project lifecycle and showing the relations between the different types of project complexities. Second, a description of the interactions between the project context and the surrounding context is represented showing how the surrounding context played a role in undermining the project context and how the consultant responded to those actions adapting three modes of responses: re-skilling, re-appropriation and empowerment. Finally, this chapter illustrates the challenges which were affecting project members' monitoring of project activities. Those challenges are categorised into five categories: team members, organisational, content-type, spatial and time-related challenges.

8.2 First Part: Project Timeline

8.2.1 Team formation

The paperless project was considered to be a continuation of a previous failing project. That project failed and assumed failing due to a conflict between both the VP consultant and the tech-vendor team. The VP consultant did not like the work of the previous tech-vendor's team and ended the project. A new team was formed to do the project.

The Tech-vendor suggested involving one of their partners to participate in the project and to work on the solution implementation. The team was managed by the consultant with the participation of a manager and a business analyst from the tech-vendor and two developers and a graphics designer from the tech-partner.

In the first week, the whole team except the graphics designer worked close to each other in the consultant office meeting on daily basis from 10:00 to 16:00. The consultant used to work on his machine while discussions were going on between the analyst and the tech-partner's developer. From time to time, the consultant would participate or was asked to participate to decide on different choices.

At the end of that week, the consultant was very optimistic about the project success expressing that to all team members. The consultant could see that the project had the support of all relevant parties. The project had the commitment of both the tech-vendor and the tech-partner. Meanwhile, the project had the VP support who promised to give all required organisational support to the project. The consultant wanted the project team to prove that they deserved the given organisational support.

The consultant was still exploring the product and whenever he would find a feature making the final product better, he would recommend incorporating that feature into project goals even if it was not related to the main scope of the project. For example, the portal search feature was not part of the project scope but when presented by the business analyst, the consultant added the search feature to the project requirements.

The business analyst claimed that the previous conflict between the consultant and the previous business analyst was because the two parties did not build a common understanding of the project before heading to implementation. The business analyst claimed that that common understanding could be built and managed by developing a storyboard document illustrating the different scenarios and specifications covered by the final product. The business analyst wanted the meetings to cover the requirements gathering and to stay away

from implementation. After the completion of requirement gathering, implementation would commence.

On the other hand, the consultant wanted to address IT senior management. Therefore, he introduced a project timeline targeting the IT executive Sunday meetings. However, the business analyst did not see the benefit from the communication with the senior management. For the business analyst, the approval of the senior management was obtained through the approval of the consultant himself. Therefore, the business analyst assumed that approaching senior management needed to wait next to reaching an internal approval.

8.2.2 Conflict with the vendor manager

8.2.2.1 Conflict with the vendor manager

Later, the tech-vendor manager approached the consultant hoping that the consultant would facilitate the agreement extension negotiation arranging a meeting between the two organisations' senior management. The consultant did not show interest where he had just transferred the issue to the VP secretary and did not give any support. The secretary did not secure a meeting for the tech-vendor manager who left unhappy. The tech-vendor manager did not join the following project meetings.

8.2.2.2 Conflict with the business analyst

On the other hand, the business analyst continued working on the project away from the consultant and stopped coming to the consultant office. The business analyst was coordinating with the tech-partner. Later, the analyst sent an email containing the final product user interface followed by a storyboard document. The consultant was asked to give a feedback to the two documents.

This initiated a series of communications over email between the consultant and the business analyst. The consultant did not give a feedback over the email or the phone but asked the team to meet in his office. In the meeting, the consultant was asked to give a feedback on the given documents but he asked for adding new photos to the user interface.

The business analyst was heading towards finalising the project and defining a deadline. This deadline was not agreed upon. In the last meeting, the business analyst pushed to reach an agreement on the portal user interface the matter which was rejected by the consultant. That was considered to be a 'rush' which was thought to lead to overlooking some very important specifications of the project.

At the end of the meeting, the consultant expressed his worries about the project progress adding that the team needed to work closer to each other. Even, he asked the tech-partner to invite the graphics designer to work with

them in his office but the tech-partner preferred to leave the graphics designer to work remotely.

Again, the business analyst turned to work away from the consultant. The business analyst sent another version asking for feedback. Next day, another update was sent by the tech-partner.

The consultant found that both the tech-vendor and the tech-partner were not able to address his ideas of the project. Therefore, the consultant worked alone on the design of the user interface. His work was repeatedly interrupted by employees and the VP. Finally, he decided to continue working on the user interface at home.

The consultant worries about the project increased. He did not like the tech-vendor attitude. He assumed that the tech-vendor did not give the project enough time and were not accepting to work closer to him on daily basis. He assumed that this would delay the project linking the delay to the negotiation of the agreement between the organisations and the tech-vendor. He assumed that the tech-vendor was not serious about the project and that they were trying to keep the project running until they would know the result of the ongoing negotiation of the agreement. The consultant's worries increased because of his knowledge of the difficulties passing by the process of signing the agreement especially with the approaching deadline of the expiration of the existing agreement.

The consultant did not prefer to use other alternatives than using the tech-vendor product. Therefore, he had no other option than dealing with the tech-vendor. Accordingly, the consultant wrote asking for the business analyst update. However, the business analyst refused to go back to work in face-to-face meetings. He stated that the continuation of the project needed an agreement on the storyboard document before moving to next steps.

8.2.3 Building a relation with the third party

Another update of the storyboard was sent by the tech-partner including a referral to a specific tool. When the consultant asked for more information about that tool, the reply came from the Tech-partner's founder.

The consultant managed to get closer to the tech-partner founder who welcomed the relationship with the consultant hoping to have more involvements and partnership with the organisation.

The tech-partner founder preferred to end the role of the tech-vendor by ending the project even without reaching all of the consultant's goals.

The consultant viewed the tech-partner to be able to replace the tech-vendor. The consultant managed to communicate again with the tech-partner's founder over NetMeeting where he had seen some of the tech-partner's previous works. The consultant was optimistic about that relationship and told the VP about it.

It seemed that for the project to reach an end, there was a requirement to thoroughly review and give a feedback on the given storyboard. The consultant met with the researcher to review and comment on the document.

8.2.4 Project termination

The VP had a meeting with the tech-vendor's senior management where they signed the extension of the enterprise agreement. In the agreement signing meeting, the consultant was given a task to coordinate with the tech-vendor and assess the utilisation of the tech-vendor's products. These efforts were called IT account planning. A meeting was arranged to kick off those IT account planning sessions and agree on action items to be executed by both parties. The consultant added to the action items list an action item related to the Paperless project.

Next to signing the agreement, the consultant worked on regaining his control on the project team. First, he needed to receive the acceptance of both the tech-vendor and the tech-partner on his written details and comments added to the storyboard document. Second, the consultant was tightening his control on the team members to the extent that he asked all project members to share their personal calendars with him.

At the same time, the consultant had threatened the Tech-vendor to freeze the project and escalate the issue to their senior management. The consultant had

threatened to freeze the other tasks resulted from signing the agreement as well. All his requirements were required to be submitted before his annual vacation date on 13 Jul 2010.

The business analyst had left the project and did not appear again while the tech-vendor manager promptly replied confirming his commitment to the given deadline stating that the tech-partner would be working within that deadline and goals specification.

Later, the consultant received an SMS from the VP inquiring about the project. The consultant was worried that there was another project running on the same issue and he might not be aware with which would change the picture. The pressure increased on the consultant where he received another email from the VP asking about the outcomes of the project. The consultant passed that email to the tech-vendor manager. The consultant wanted to bring more attention to the project.

However, the time passed and the product was not delivered on 13 Jul 2010. The tech-vendor claimed that the project was delayed because of the tech-partner. The consultant left in a vacation and after his return, he was appointed as a GM leaving his position as a VP consultant.

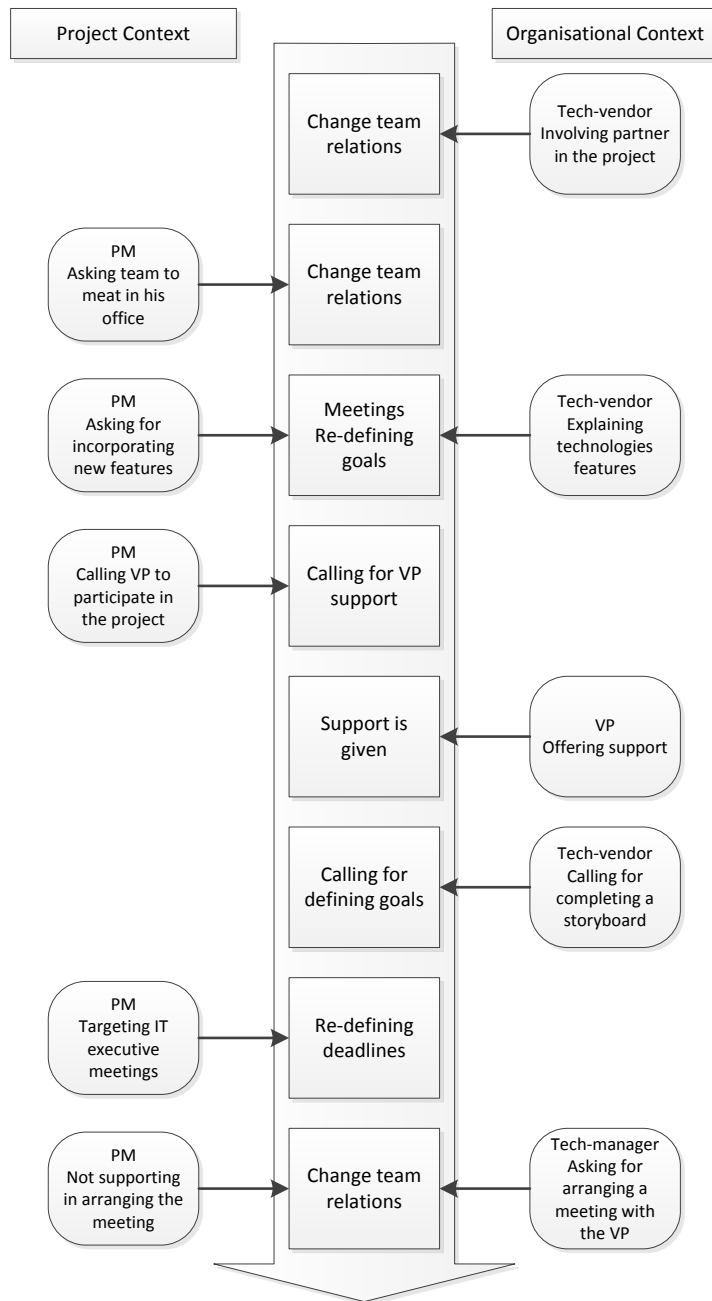


Fig 8.1 Paperless correspondence project timeline (Part 1)

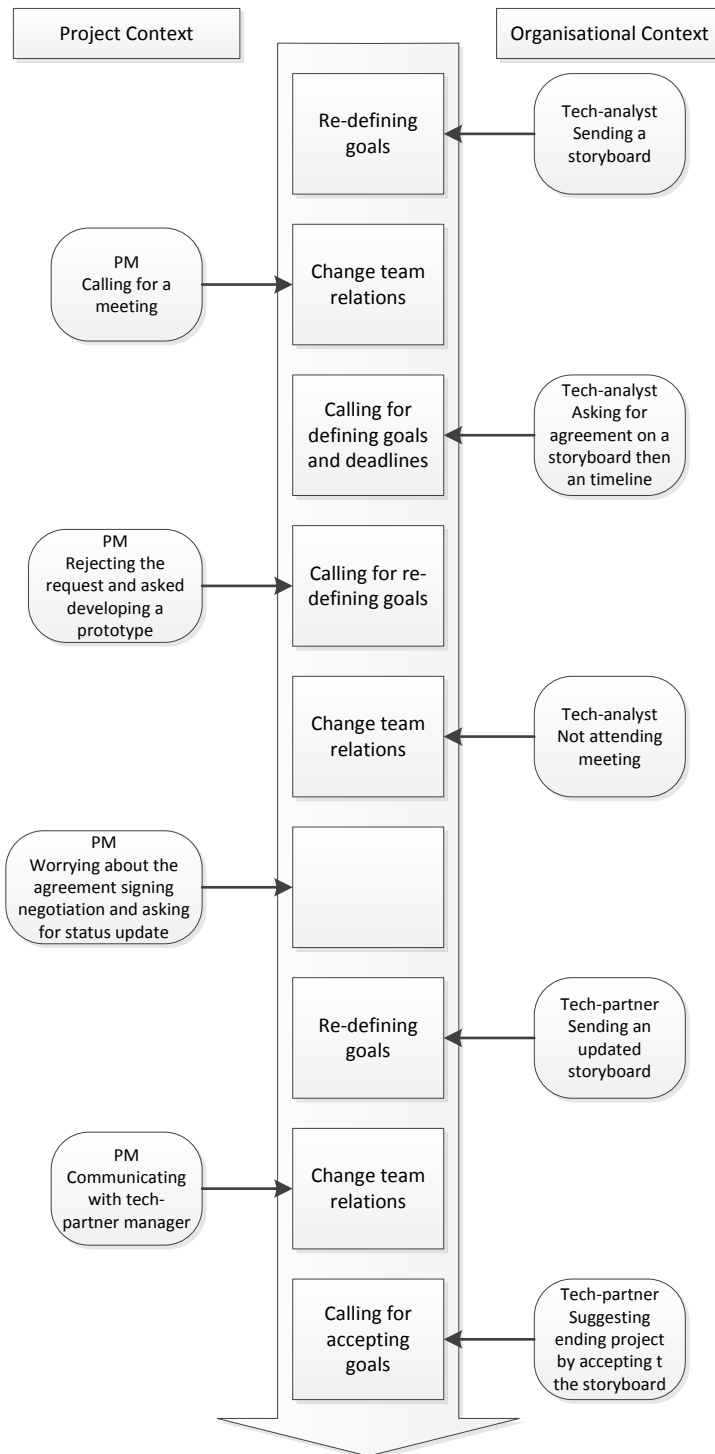


Fig 8.2 Paperless correspondence project timeline (Part 2)

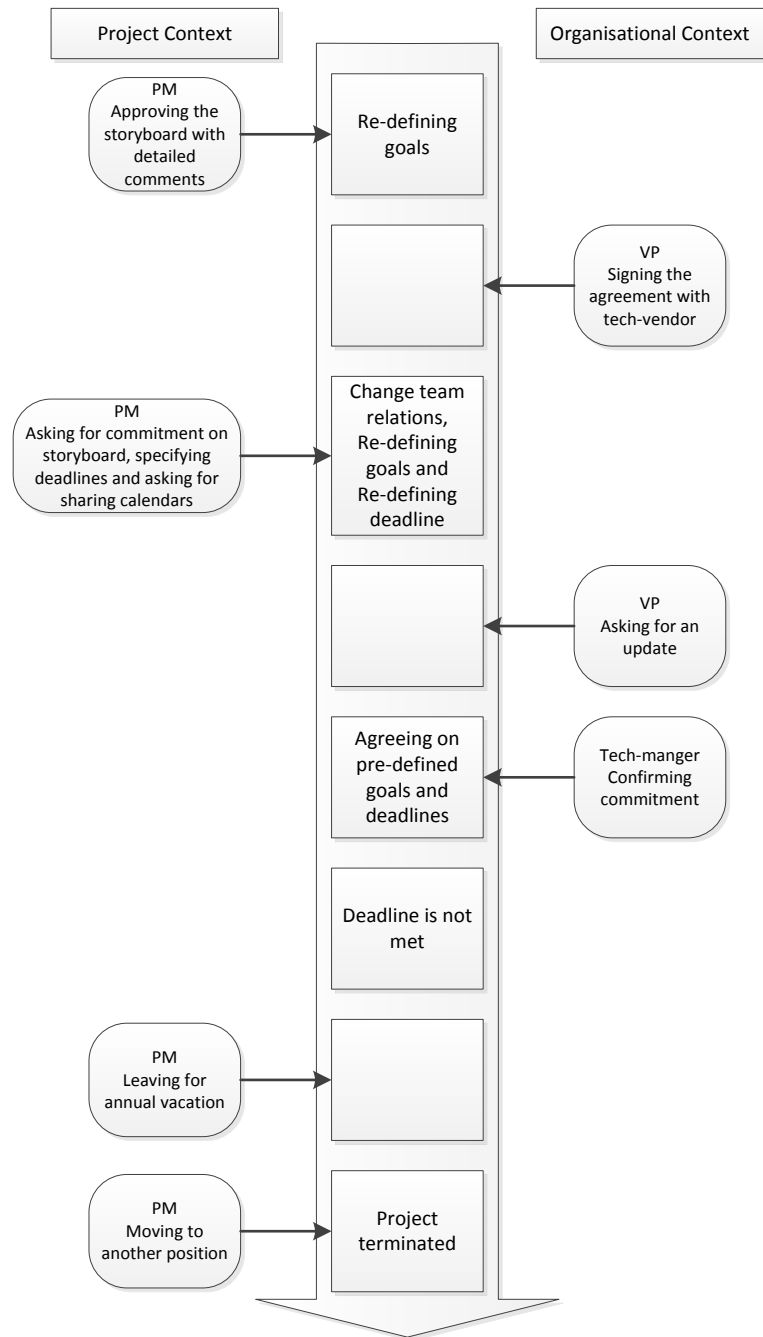


Fig 8.3 Paperless correspondence project timeline (Part 3)

8.3 Second Part: Project Complexity and Surrounding Context Challenges

8.3.1 Project Complexity

8.3.1.1 Time-related complexity

Well-defined deadline is assumed to reduce project time-related complexity (Manning 2008). Relaxed deadline which is not tight helps project to stay away from time-related complexity (Williams 1995, 2003). In the Paperless project, deadlines were not well-defined where the project was not precisely having a delivery date. Meanwhile, the project manager decided to adapt a relaxed timeline.

Project members were dedicated to the project working together on daily basis. They would meet daily from 10:00 to 16:00. That was only except on Sundays when the consultant was engaged in another meeting from 9:30 to 11:00. On Sundays, project members would start meeting at 13:00.

"Consultant: Next week on Sunday, I will be busy with the executives meeting from 9:30 to 11. We can meet afternoon."

Even after working hours, the consultant expressed his availability any time after working hours.

"From: Consultant"

To: Business analyst

... I am and will be available for your call any time 24/7."

The consultant demonstrated that by communicating with project members over emails late at night. All needed time was given to the project. Project members would be in a meeting all around working days and after working hours they would continue communicating over email.

Meanwhile, the project did not have a specific well-defined deadline. The business analyst tried to finalise some project activities but that was refused by the consultant who found that delivering a better product would benefit from project's relaxed timeline. Therefore, project members should not hurry to end project activities but they should utilise all the available time to improve the final product.

***"Business Analyst:** Let's agree on the user interface so we are done with it*

***Consultant:** No, we should not rush on this. It is very important.*

***Business Analyst:** Ok, so let's start discussing it."*

Finally, instead of working towards a fixed deadline, the consultant chose to work against a changing deadline. The consultant was targeting the IT executive weekly meeting which was conducted every Sunday.

***"Consultant (interrupting):** If we (project team) are ready, I may let you (business analyst) present the product in this executive meeting.*

The consultant connected his laptop to the projector so we (the team) can see his screen. He opened a Visio file and started to make a timeline.

Next day, the consultant sent the timeline. Tech-partner would work on the design for the whole week. Project members would meet the following Saturday to review and decide on the look and feel. The team would meet on daily basis from Saturday to Monday. The following Saturday, tech-partner was asked to go back and apply the outcomes of the review meetings. Saturday was to be a preparation to the final product which was going to be presented to executives meeting on Sunday 19th of June 2011."

The consultant had set a deadline targeting the following IT executive meeting.

That was assumed to put pressure on the project increasing project time-related complexity. However, the consultant had stated that the deadline was not fixed where project members would target the following executive meeting and if they could not reach the target they would target the following executive meeting.

***"Consultant:** We need to try to catch up with this executive meeting if not being able to do this we would need to target the next executive meetings."*

Although the project deadline was not well-defined, project time-related complexity did not increase because the project was not pressured by tight timeline and all members were dedicating all available times during and after working hours to the project. Even after targeting to deliver the final product in the executive meeting that did not turn project deadline to be tighter since the project deliverables could be presented to any executive meeting and not specifically the following one.

8.3.1.2 Technical and technological complexity

Technical and technological complexities reduce when the applied method is well-defined (Williams 1999, Turner and Cochrane 1993). Those complexities decrease when project team has all specialities required for completing the project integrated in one group (Baccarini 1996, Jones 1997).

The paperless project did not suffer from technical and technological complexities where the project was, from the beginning, built to utilise the tech-vendor's product. The consultant was not considering any other alternatives.

***"Researcher:** So, you want to use the Tech-vendor product. Isn't it?*

***Consultant:** According to my research, the Tech-vendor's product is one of the leading products in the market."*

The project maintained simple technical and technological complexities especially because the project team did not require any technical inputs from another group. The project team had all specialities required for accomplishing the final product. The business analyst was familiar with the product capabilities while the tech-partner had developed many solutions using the product.

8.3.1.3 Organisational complexity

The paperless project was considered to be a continuation of a previous failing project. A new team was formed to do the new project. The team was managed by the consultant with the participation of a manager and a business analyst from the tech-vendor and two developers and a graphics designer from the tech-partner. The whole team except the graphics designer were working close to each other reporting to the consultant.

All project members were supposed to be working under the supervision of the consultant. The tech-vendor members were communicating with the consultant and getting his approval for all project details. However, the tech-partner seemed looking for tech-vendor approval to accept the consultant changes.

However, the business analyst was asking them to follow the consultant.

"The consultant suggested that a photo could be utilised in the portal design. That photo was part of an old organisational marketing campaign. The tech-partner developer had doubts that the photo can be used but the business analyst said that they would check to see what the graphics designer could do."

As explained, the project organisational structure was very simple because members from all groups were working as one group seeking approval on activities only from the consultant. Meanwhile the consultant was able to obtain information from any project members directly.

The consultant valued the simplicity of the project organisational structure and the proximity between all project members. Therefore, he asked the tech-partner to invite the graphics designer to work with them in his office.

"The consultant asked the tech-partner if it is possible to invite the graphics designer to work with them in his office. The tech-partner replied that they would prefer to leave the graphics designer the space to work alone and produce creatively. The consultant agreed on that for the time being, adding that after introducing the first design it might be useful to invite him."

8.3.1.4 Structural Complexity

Finally, the complexity in project goals shapes the project structural complexity (Williams 1999). Structural complexity results from ill-defined goals (White and Fortune 2002, Dvir et al. 2003) and increases as a result of the increase in the number of project goals and the interdependencies between project goals (Baccarini 1996).

The project had started for delivering two goals. The first goal was to develop and design a portal environment based on the tech-vendor product while the second goal was to develop a paperless IT correspondences solution where all requests made electronically on top of the portal environment. However, the details of the two goals were not well-defined.

8.3.1.4.1 Personal goals

The project was not away from achieving personal goals which were not agreed upon as main project goals. Two personal goals could be identified. One was a personal goal to the tech-vendor manager while the second goal belonged to the consultant.

The tech-vendor manager considered that project to be helpful in facilitating the extension of the enterprise agreement between the tech-vendor and the organisation. The agreement was about to expire and negotiations were taking place between the two organisations. The tech-vendor manager utilised the project to be closer to the VP and to continue negotiating the agreement with him. At the same time, the tech-manager tried to use his daily relationship with the consultant to secure meetings between the tech-vendor senior management and the VP.

On the other hand, the consultant wanted to deliver a successful project to senior management. The consultant wanted to prove that his project team deserved the given organisational trust and support.

8.3.1.4.2 Delaying goals definition

The project goals were not well-defined. The project goals were identified from the beginning of the project but the goals details and specifications were not

clearly stated. Goals details were developing over time. That was viewed by project members in two ways.

First, the consultant wanted to allow goals details to improve and advance over time to enable project members to deliver a good product which could satisfy senior management and show that the project deserved their support.

***"Consultant:** We should not rush on this (agreeing on user interface). It is very important."*

On the other hand, the business analyst assumed that project goals details could be generally agreed upon and articulated in a storyboard document. At the same time, they could continue changing over time. The business analyst assumed that an agreement could be made on the project main goals details then the remaining details or changes to those details could be made later during the project progress.

***"Business Analyst:** This design is just an example. We asked the designer to come up with something and this is what he has done. Even, he (the designer) does not know that we are talking about a correspondence workflow."*

The consultant wanted to leave project details open until he would find them advanced enough to gain the senior management satisfaction while the business analyst wanted to agree on a minimum set of details as a baseline. Then those details could be discussed and changed over the project lifecycle. In both approaches, the consultant and the business analyst showed an acceptance to

the project ill-defined goals leaving them to progress and be defined over the time.

8.3.1.4.3 Changing goals

The project goals were open to modification. The consultant would not hesitate to add to the project goals and specification any feature which he would assume that it would help the final product to look better. The consultant would recommend incorporating that feature to the details of the project goals. The feature was incorporated even if it was not related to the main goals of the project.

For example, the portal search feature was not part of the project scope but when presented by the business analyst, the consultant added the search to the project requirements.

***"Consultant:** Yesterday, in your (business analyst) presentation you were talking about the search feature including the indexing services. This can be very beneficial to us since our environment is heterogeneous and consisting of many disconnected networks. This portal can be a platform for connecting all of these networks."*

The consultant was not limited to take features from the tech-vendor product features list. He was open to include anything even he included photos from an old organisational marketing campaign to be used in the user interface design.

"The consultant was checking his laptop when he showed a photo of a transparent electronic horse. He suggested that the photo could be utilised in the portal design. That photo was part of an old marketing campaign held by the organisation."

Similarly, he was open to any suggested feature from any project member.

"When, the researcher showed the consultant [a website]. He liked the structure of the website especially the lower side menu bar of the main page. He took a screen shot of the page and emailed it to the whole team:

Attached is a very beautiful web page that [the researcher] and I really admire. Please have a closer look at it and please discuss with me your impression, which I am sure isn't going to be distend from what we had."

In summary, although the project was launched to achieve two goals, the project included other personal goals. The tech-vendor manager aimed to use the project to facilitate the negotiation of the extension of the enterprise agreement while the consultant wanted to show that he deserved the support given to him by the VP. At the same time, the details of the two goals were not well-defined. The project goals were accepted ill-defined leaving them to develop over the project lifecycle. Finally, the project goals were open to modification over time where the consultant would add to the project any feature which would help in making the project better.

8.3.2 Interactions with surrounding context

8.3.2.1 The relationship between the VP and the VP consultant

Both the VP and his consultant had a very close and old relationship. Before being assigned as a VP, the VP was a project manager of the ERP implementation project and the consultant was a member of the project team. Next to the successful completion of the ERP project replacing old systems with the new ERP system, the organisation DG rewarded the project manager appointing him as an IT VP. The VP in his turn had appointed many of his project members to various positions around the IT departments. The VP consultant refused to get any position and preferred to work next to the VP. The highest position in the VP office was the office manager which was looked at as a secretarial job.

***"Consultant:** I wouldn't accept to work as an office manager organising VP's appointments."*

Therefore, to maintain his technical image he was appointed as a VP technical consultant. The VP consultant was treated as one of the senior management attending the IT weekly executives meeting on Sundays. The consultant position was created for the first time and as the VP consultant said:

***"Consultant:** It is most probably will be cancelled after I leave the position."*

The VP consultant was directly reporting to the VP. He refused to leave his position to another position because he did not want to lose direct communication with the VP. The consultant felt that his privilege in the IT was due to his close relationship with the VP IT. Therefore, He would accept to have more responsibilities but without losing the direct connectivity with the VP which he was worried that the VP might change.

Similarly, the VP knew the privilege involved in directly reporting to him. When the consultant requested to take some of the VP's tasks to be solely under his responsibility, the VP rejected reminding the consultant with the privilege which he had out of being closely connected to him.

***"Consultant:** This is the issue. I was talking to the VP asking for some favours which were not personal ... except one. The VP answered me wondering what else I could be asking for more than directly reporting to him."*

The VP consultant used to help the VP in his duties where the VP would assign some special assignments to the consultant to perform and manage. In the assigned tasks, the VP consultant used to act according the VP power asking departments' managers to act upon his well.

The VP was holding his position as an acting position. Later during the study, the VP was permanently appointed and the consultant was happy for this permanent appointment.

***"Consultant:** Definitely the VP would return to office after his promotion and many employees are expected to come to congratulate the VP. I will bring some cakes and deserts for this."*

8.3.2.2 The relationship between the VP consultant and IT departments

As introduced in the relationship between the VP and the consultant, the consultant used to be given some special assignments from the VP to work with other IT departments, vendors and contractors. In addition, the consultant was responsible for approving some internal and external requests on behalf of the VP. The consultant was responsible for approving hardware distribution to all organisational departments and was responsible for approving business trips, parking permits, and other financial funds in the IT. That role helped the consultant to maintain a good relationship with end-users and internal IT departments where employees used to approach him to access those resources.

Meantime, the consultant had an access to quick and good services from existing IT departments. Those services were only a call away.

***"Consultant:** Now, I'll call them (Ops-contractor) to come and fix it.*

The consultant called the secretary asking him to let someone from Ops-contractor to come and fix the machine immediately."

The consultant had the freedom of bypassing IT rules and policies where for example, his mailbox was not limited with size limits. He was allowed to benefit from all IT services without joining the network domain. Those exemptions

were facilitated by other IT departments since technical interventions were required to allow the consultant to bypass those rules and policies.

The consultant was equipped with all kinds of hardware which helped him to do his job. That included laptops, iPad and a projector. That was besides multiple unlimited data Sims for mobile connectivity.

However during assignments, the consultant could face some conflicts with some departments who thought that the consultant was limiting their technical freedom and choices.

***"Consultant:** Once, the VP asked me to help a department in finalising a task. He told me that the issue is my responsibility. I contacted that department's system manager and gave him a long list of questions about the environment more than 90 questions. The system manager did not answer them and said that he was going to bring the vendor to give a better answer. It took him two weeks to bring the vendor who did not give an immediate answer and promised to return back to us but they did not. It seemed that they got used to that department rhythm."*

The conflict with some departments increased because the consultant used to discuss the performance of those departments with concerned IT senior management.

***"Consultant:** I kept following on them (development department) copying the GM and the VP with no reply. Until, the GM told me to forget about them there is no one working there."*

8.3.2.3 The relationship between the vendor and the consultant

The relationship between the organisation and the tech-vendor was not old.

The two parties were trying to increase the cooperation between the two companies. The organisation had an enterprise agreement with the tech-vendor enabling the organisation to utilise the tech-vendor's products.

The agreement was about to expire and needed to be extended however the IT VP was reluctant to accept the extension where he raised a complaint to the tech-vendor senior management claiming that the organisation was paying for products which were not able to use.

The tech-vendor was keen to maintain the relationship and to extend the agreement between the two companies therefore the tech-vendor senior managers committed to help the organisation in utilising the unused products and promised to participate in projects to show the strengths of those products and how they could result in an organisational benefit.

The paperless project was one of those projects which the tech-vendor promised to participate in helping the organisation to benefit from the tech-vendor products. The project was centred on the use of a specific portal and workflow technology. The paperless project was not initiated for the first time. It was preceded by a previous failing run of the same project. The failing project was managed by the consultant who did not like the contribution of the tech-

vendor members and decided to terminate the project reporting the failure to the tech-vendor senior management.

The tech-vendor renewed their commitment and support to the organisation and assigned new team to work with the consultant. Meanwhile, the bus-vendor had acquired the help of one of their partners to implement the project.

In general, the consultant could see that the project had the support of all relevant parties. First, the project had the VP support who promised to give all required organisational support to the project and the consultant had an easy access to all organisational support. Second, the project had the commitment and the participation of both the tech-vendor and the tech-partner. The consultant wanted to benefit from all these success factors. The consultant wanted the project team to prove that they deserved the given organisational support.

8.4 Third Part: A Structurational Analysis

8.4.1 Project Structuration

8.4.1.1 Structural Complexity

As explained previously, the project suffered from structural complexities due to ill-defined goals, multiple personal goals and changing goals over the project

lifecycle. On the other side, the project was away from time-related, technical and technological and organisational complexities.

However, over the project lifecycle, the project was not static where project complexities changed from time to time due to project members' activities managing project structural complexity. At the same time, the project was subject to changes because of the interactions with the surrounding context.

8.4.1.2 Technical and technological complexity

Technical and technological complexities did not change over the project lifecycle. The used technology was developed by the tech-vendor and the consultant did not consider changing that technology to use another one. The consultant adapted the tech-vendor's signification of the used technology.

***"Researcher:** And if the agreement is not signed, will you use another product to complete the project?*

***Consultant:** The problem is that tech-vendor will not support us.*

***Researcher:** So, you want to use the tech-vendor product. Isn't it?*

***Consultant:** According to my research, the tech-vendor's product is one of the leading products in the market.*

8.4.1.3 Organisational complexity

The consultant valued the close relationship between the project team. All project team members worked in his office except the tech-partner graphics

designer who was wanted to be invited by the consultant to work with the project team in his office.

"The consultant asked the tech-partner if it is possible to invite the graphics designer to work with them in his office. The tech-partner replied that they would prefer to leave the graphics designer the space to work alone and produce creatively. The consultant agreed on that for the time being, adding that after introducing the first design it might be useful to invite him."

However this relationship between the project members did not continue to the end of the project. First, the tech-vendor manager quit attending the project meetings then the business analyst did the same.

8.4.1.3.1 Conflict with the vendor manager

As shown before, the project was not away from the negotiation of extending the agreement between the tech-vendor and the organisation. The tech-vendor manager aimed to use the project to facilitate the negotiation where he approached the consultant to help him in his goal.

The tech-vendor manager came to the consultant office requesting to arrange a meeting with the VP for his senior management. He claimed that he managed to see the VP during project meetings and the VP promised to meet the Tech-vendor's senior management.

The consultant did not show any interest where he only transferred the request to the VP secretary and did not give any support. Even, the consultant left the tech-vendor manager in his office and went to the VP office and talked about different subjects and did not even open the subject of the request with the VP. The VP secretary did not arrange the meeting. The tech-vendor manager was frustrated after his talk with the VP secretary.

***"Tech-vendor manager:** He (VP secretary) wants to philosophise on me. I'm telling him that I want an appointment for our CEO and he says that he had met the VP before. We are trying to improve the relationship and keep it in a good shape. At the end, they have to meet. There is no other way. It is better that they meet in a good and respectful way. If our CEO sends a meeting request and the request is declined, it will be a big problem."*

Later, when the consultant came back to the office, the tech-vendor manager was still waiting there. He asked if the requested appointment was made.

***"Consultant:** Unfortunately, next week, the VP is busy. He has a business trip for three days and on Sunday, he has the executive meeting. Tech-vendor manager left and he was not happy at all."*

The tech-vendor manager did not join the following project meetings. When the researcher asked the consultant about the tech-vendor disappearance, he replied that he was angry for not helping him to meet the VP.

The tech-vendor manager signification to project goals involved facilitating the agreement extension negotiation. When he realised that the consultant was not willing to help him and did not share the same signification, he left the project. The project team lost him but the consultant ignored the manager absence since he did not have a significant role in the structuration of the project. the tech-vendor role was limited to connecting the consultant with the business analyst which had been already done.

8.4.1.3.2 Conflict with the business analyst

On the other hand, the business analyst was heading towards finalising the project and defining a deadline but the consultant was in favour of maintaining an open deadline strategy aiming to producing the best possible product. The business analyst pushed to reach an agreement on the portal user interface the matter which was rejected by the consultant.

"Business Analyst: *Let's agree on the user interface so we are done with it*

Consultant: *No, we should not rush on this. It is very important.*

Business Analyst: *Ok, so let's start discussing it."*

The consultant did not like the tech-vendor attitude. He assumed that the tech-vendor did not give the project the enough time and were not accepting to work closer to him on a daily basis.

On the other side, the business analyst claimed that the conflict in the previous project between the consultant and the previous business analyst was because the two parties did not build a common understanding (signification) of the project before heading to implementation. The business analyst suggested the development of a storyboard document which would illustrate the different cases and scenarios covered by the final product (documentation of goals signification). The business analyst wanted the meetings to cover requirements gathering and to stay away from implementation. Once, the first stage was completed he would move to the implementation phase. Therefore, the business analyst rejected to go back to work in face-to-face meeting stating that the work would need an agreement on the project signification represented in storyboard document before moving to next steps.

"From: Business Analyst,

We have combined portal and workflow requirements as one "Envisioning" document for the project with a new template (as attached).

Since currently we are gathering your business requirements as a detailed document, we would like to receive your feedback to achieve this goal.

Once we have an agreed on document then we will move to the planning/development phase(s) as the next steps."

The business analyst worked on connecting the consultant with the tech-partner where the business analyst used to guide their work. Losing the business analyst would mean losing the connection with the tech-partner. The consultant had to make a choice. He had to accept building upon the proposed

storyboard to allow the project to proceed. However, the acceptance of the storyboard involved an acceptance of freezing project goals signification.

8.4.1.3.3 Connecting with tech-partner

The consultant continued working alone while the business analyst and the tech-partner sent updates of the storyboard waiting for his acceptance. In one of those updates, the tech-partner developer mentioned a specific tool which the consultant did not know.

*"From: Consultant
But, what [X2] stands for?"*

The consultant email was late at midnight. However, a reply was sent from the tech-partner founder who was copied:

*"From: Tech-partner founder
To: Consultant
I see you are still awake and sorry for disturbing you that late!
[X2] is the workflow part that work on the top of [tech-vendor product] and that will handle the automation of the process and this is a simple to manage workflow engine and will be easy to administer without any coding involved."*

The consultant viewed the tech-partner to be able to replace the tech-vendor and to share the consultant in the structuration of the project. The consultant managed to communicate again with the tech-partner's founder over

NetMeeting where he had seen some of the tech-partner's previous works. The consultant was optimistic about that relationship and told the VP about it.

***"Consultant:** I have talked with the founder of the Tech-partner. We had a NetMeeting. The founder showed me some examples of the websites which they have previously developed. We talked a lot. At the end, we agreed that this Saturday, he will present us a prototype. I told the VP about this prototype."*

The tech-partner founder needed to end the role of the tech-vendor by ending the project even without reaching all of the consultant's goals.

"The consultant called me (the researcher) next day at home. He talked about many issues. He told me that he talked with the Tech-partner's founder who explained to him why this project was facing some problems."

***Consultant:** The tech-partner founder thought that the tech-vendor was behind all project problems. He claimed that the business analyst was insisting on finalising the storyboard exercise prior doing any work. This, according to tech-partner proved not to be properly working. The tech-partner founder gave a recommendation to be flexible in accepting the storyboard as it is. This helps in ending the role of the tech-vendor in the project. Then, the tech-partner is going to develop the portal and do all required changes ... the tech-partner's founder looks very confident."*

In summary, the project had started with a very simple project team who were working next to each other in the consultant office. Later, the tech-vendor manager had left the team when the consultant did not consider facilitating the agreement extension negotiation as part of project goals. Next, the business analyst stopped the face-to-face meetings calling for the consultant acceptance

of the storyboard freezing project goals signification prior to project implementation. Meanwhile, the consultant had started direct communications with the tech-partner founder who showed an interest in building a strong relationship with the organisation. However, he recommended the consultant to accept the storyboard to let the project complete and end the role of the tech-vendor so the tech-partner could have a direct relationship with the organisation away from the tech-vendor. Accordingly, through the progress of the structuration of project goals project team structure passed through different changes.

8.4.1.4 Time-related complexity

As introduced previously, the project had an open deadline. The consultant wanted to present the best possible product to IT senior management allowing longer goals signification period. Therefore, he introduced a signification of project timeline targeting the IT executive meetings. This timeline was relaxed because it did not target a specific meeting but any future meeting when the project was going to be ready.

***"Consultant (interrupting):** If we (project team) are ready, I may let you (business analyst) present the product in this executive meeting ... We need to try to catch up with this executive meeting if not being able to do this we would need to target the next executive meetings."*

However, due to different reasons the project was subject to time pressure. First, the agreement between the tech-vendor and the organisation was about to expire. Second, the senior management were asking about the outcomes of the project. Finally, the consultant reason behind the open deadline strategy was chosen to enable the team to produce a better product. After the conflict between the consultant and the team members on accepting the storyboard, the goals were assumed to be well defined. Therefore, there was no more need for an open deadline. Oppositely, the consultant put time pressure on team members to complete the project.

8.4.1.4.1 Extending the agreement between the organisation and tech-vendor

The end result of the project was perceived to affect the negotiation of the agreement between the two organisations. Meanwhile, if the negotiation would fail prior to the end of the project, that was assumed to negatively affect the project.

***"Consultant:** I'm afraid that if the agreement is not signed they [Tech-vendor] will stop responding to our requirements. I know that they most probably will stop this project."*

The consultant linked the project progress to the negotiation of the agreement. He worried that the tech-vendor members were not serious about the project and were trying to keep the project running until they would know the result of the ongoing negotiation of the agreement. Those worries increased because of

the difficulties passing by the process of signing the agreement especially with the approaching expiration of the existing agreement.

***"Consultant:** I have some worries about the Tech-vendor role in this project. To this moment, the organisation had not signed yet the enterprise agreement with them ... The signs are not good and the agreement may not be signed while the deadline is approaching and the old agreement would expire soon.*

I'm afraid that if the agreement is not signed they will stop responding to our requirements. I know that they most probably will stop this project."

The approaching expiration of the agreement put time pressure on the project where the consultant needed to finalise the project before the end of the agreement.

***"Consultant:** Mainly, I need three more weeks starting from today to complete the project."*

8.4.1.4.2 VP time pressure

From the other side, the time pressure increased on the consultant where he received multiple enquiries from the VP asking about the outcomes of the project.

"From: VP

To: Consultant

I am meeting HEDG tomorrow afternoon. Is there a way I can brief him about the above project and provide him with the executive summary of the accomplishments?"

8.4.1.4.3 Time pressure

The open deadline policy continued as long as the project goals were progressing and developing in front of the consultant and in his office. When the consultant sent his feedback on the storyboard, he requested the business analyst and the tech-partner to incorporate some changes to the document and requested a timeline of the implementation. The consultant feedback was considered as an acceptance of a set of well-defined goals. After the feedback, the consultant started to put time pressure on the project team members.

"From: Consultant

To: Tech-vendor Manager

I am awaiting your feedback in below action items and tech-partner to send the revised Storyboard document. Further, I requested earlier from the business analyst a plan until the concluding of the project. Please include in your reply. I regret to say I will have to freeze all activities from my side if we can't keep up with agreed actions items."

The consultant was tightening his control on the team members to the extent that he asked all members to share their personal calendars with him.

"From: The consultant

...

Everyone sends his personal calendar in order to plan activities accordingly."

Meanwhile, the consultant set a deadline for project tasks. The deadline was set from one side without consulting the project team members.

"From: The consultant

By this coming Wed July 13th, I must have the following:

- 1) Completed SB document revised by both Tech-vendor and Tech-partner. IT is not obligated to its content.*
- 2) Prototype that shows all requested development in both portal and Workflow.*
- 3) Complete roadmap for the remaining work including deployment and post implementation support."*

At the same time, the consultant had threatened the tech-vendor to freeze the project and to escalate the issue to their senior management if they failed to meet the deadline.

"Failing to deliver the above as requested, I will send to the [Tech-vendor] executives on Wed July 13th an official email with freeze notice and I will stop from my side all activities including the IO exercise.

I urge all to take corrective measures to streamline this endless cycle as we have other important issues in life."

In summary, the project had started with a relaxed timeline signification away from time-related complexities. Then, during the project progress, time pressures increased increasing project time-related complexities. First, time pressure increased due to the approaching expiry of the agreement between the two organisations. Second, it increased due to an increasing demand from the IT senior management to see the project outcomes. Those time pressures led the consultant to change his signification to project deadlines where he set them to

be fixed and tight threatening to terminate the project if those deadlines were not met.

8.4.2 Organisational context undermining project context

The project structuration was not away from the effect of the surrounding context. Project goals, deadlines and team relations significations were subject to changes due to actions related and initiated from the outer context. The project context had been affected by actions exerted by external vendor and IT senior management. First, the tech-vendor manager left the project team without any prior notice then the tech-vendor business analyst forced his view on the need to have a well-defined goals specification articulated in a storyboard making this approach a condition for project continuation. On the other hand, the VP did not want to accept to sign the enterprise agreement with the tech-vendor which was undermining the continuation of the project.

8.4.2.1 Vendor undermining project context

The project context was undermined by tech-vendor members' actions. First, the project was undermined by the tech-vendor manager and second by the business analyst.

First, the tech-vendor manager was part of the paperless project team helping the consultant to connect with the business analyst and the tech-partner. The tech-vendor manager had a project goals signification including a personal goal

of facilitating the negotiation of extending the enterprise agreement between the tech-vendor and the organisation. The tech-vendor manager joined the project meetings on daily basis to have an access to IT senior managers and to convince them to extend the agreement before expiring.

***"Tech-vendor manager:** We are trying to improve the relationship and keep it in a good shape. At the end, they have to meet. There is no other way. It is better that they meet in a good and respectful way. If our CEO sends a meeting request and the request is declined, it will be a big problem."*

The consultant did not show an interest in supporting the tech-vendor manager convincing the VP to extend the agreement. Moreover, he did not support the tech-vendor manager in his attempts to meet the VP. When the tech-vendor manager realised that the consultant and the project do not share him the same signification and would not help him in facilitating the agreement extension which was his personal goal in the project, the tech-vendor manager left the project and did not join the following project meetings.

***"Researcher:** Where is the [tech-vendor] manager? Why did he disappear?*

***Consultant:** He is angry for not helping him to meet the VP."*

Second, the business analyst joined the project with a view that the previous project failed because the project team did not have a shared signification about project goals. The business analyst wanted to articulate and freeze that project goals signification in a storyboard document.

"Business Analyst: This effort (previous project) failed previously when a conflict happened between both the consultant and the previous business analyst."

On the other side, the consultant wanted to build a prototype representing project outcomes and continue improving it till reaching the project end. The consultant had prepared a timeline based on his signification of an iterative progress of the prototype (project goals).

"The consultant sent the timeline. Tech-partner would work on the design for the whole of the week. Project members would meet the following Saturday to review and decide on the look and feel. The team would meet on daily basis from Saturday to Monday. Till the following Saturday, tech-partner was asked to go back and apply the outcomes of the review meetings."

The consultant view was dependent on the idea that the project team should work close to each other on daily basis. However, this signification to project team was undermined by the business analyst action moving to work away from the consultant. That created a conflict between the two significations where the business analyst tried to force his view in the project by sending the project design to the consultant asking for his approval to continue with the implementation.

*"From: Business Analyst,
We have combined portal and workflow requirements as one "Envisioning" document for the project with a new template (as attached)."*

Since currently we are gathering your business requirements as a detailed document, we would like to receive your feedback to achieve this goal.

Once we have an agreed on document then we will move to the planning/development phase(s) as the next steps."

The business analyst first stopped meeting the consultant in his office and only continued communicating over email. Finally, he stopped answering his email waiting for an approval on the storyboard before continuing project activities.

The business analyst undermined the consultant view and timeline and in general his role as a project manager.

8.4.2.2 Senior management undermining project context

The project context was not away from IT senior management. IT senior management represented in the VP had undermined the project context from two different ways. First, the project was undermined by not extending the agreement with the tech-vendor. At the same time, the project was undermined by assigning other tasks to the consultant ignoring his involvement in the project activities.

First, extending the agreement between the organisation and the tech-vendor was one of the external events which left an effect on the project activities. The project had started during the agreement negotiation where the tech-vendor was trying to convince the organisation to sign an enterprise agreement including the portal and the workflow which the project was using. Reaching a

successful project end would encourage the organisation to sign the agreement. However, if the agreement was not signed the project was most probably to be terminated before completion. The end result of the project was perceived to affect the negotiation of the agreement. At the same time, if the negotiation failed prior to the end of the project, that was assumed to negatively affect the project.

***"Consultant:** I'm afraid that if the agreement is not signed they [Tech-vendor] will stop responding to our requirements."*

Although signing the agreement was important for the project continuation, the VP undermined the project context and was not ready to accept signing the agreement. The VP did not consider the importance of the agreement negotiation to the project as that was considered by the consultant.

***"Consultant:** To this moment, the organisation had not signed yet the enterprise agreement with [the tech-vendor] ... The signs are not good and the agreement may not be signed while the deadline is approaching and the old agreement would expire soon."*

Second, the consultant continued receiving requests from the VP to participate in other projects and events regardless of his involvement in the Paperless project. During the project, the VP had assigned the VP to work on an urgent security compromising incident. The consultant had to work with external vendor on investigating the incident, finding the security vulnerability and

fixing them. Again, the VP did not consider the involvement of the consultant in the Paperless project undermining his involvement by this assignment.

8.4.3 Responding to organisational context

8.4.3.1 Responding to vendor

The tech-vendor undermined the project in two ways. First, the tech-vendor manager left the project team and stopped attending project meetings. Second, the business analyst put the approval on the storyboard document as a condition to continue the project activities. The consultant responded to those undermining actions in different ways.

First, the consultant did not see the value contributed by the tech-vendor manager in the structuration of the project. He assumed that the absence of the tech-vendor manager would not affect the project progress as long as the agreement between the tech-vendor and the organisation had not expired yet. The tech-vendor manager role involved connecting the consultant with the business analyst and the tech-partner which he had already done. Therefore, the consultant ignored the tech-vendor manager and continued working with the business analyst and the tech-partner.

Second, the consultant did not agree with the business analyst on the need for having a storyboard document including all project goals and scenarios. When the business analyst stopped working waiting for the approval on the

storyboard document the consultant had the chance to continue with the tech-partner ignoring the involvement of the business analyst. The consultant managed to start communicating with the tech-partner founder who welcomed the relationship with the consultant hoping to have more involvement and partnership with organisation. A close relationship with the tech-partner introduced a solution to the conflicted relationship with the tech-vendor where the consultant viewed the tech-partner to be able to fulfil the role of the tech-vendor. The consultant agreed with the tech-partner to develop a prototype.

***"Consultant:** I have talked with the founder of the Tech-partner. We had a NetMeeting. The founder showed me some examples of the websites which they have previously developed. We talked a lot. At the end, we agreed that this Saturday, he will present us a prototype. I told the VP about this prototype."*

In summary, the consultant responded to the vendor undermining actions with a re-appropriation mode where he did not accept to change the project to meet the vendor demands rather he managed to use the available connections to replace the absence of tech-vendor's members. When the tech-vendor manager left the team the consultant did not accept to adapt to his signification of project goals supporting the extension of the agreement but he continued working with the business analyst and the tech-partner. Then, when the business analyst stopped participating in the project, the consultant did not accept to approve the freezing of project structuration and continued working with the tech-partner.

However, the consultant response did not help the project to complete since the tech-partner who was the last group involved in the project team asked the consultant to accept the storyboard to end their commitment with the tech-vendor. Therefore, the consultant decided to accept reviewing the storyboard document adding more specifications and details to the suggested final version of project goals signification. Again, that was seen as a re-appropriation action where the consultant accepted the storyboard but after adding many features and details to the final product.

Meantime, the consultant realised that the extension of the agreement would empower his position in the project and realised that the VP did not consider the importance of the extension to the project completion. Therefore, he influenced the VP decision to extend the agreement which was extended and the consultant had the power to re-control project activities again.

"From: The consultant

Now if you think we will keep doing the same thing; beating around the bush since Mar 2nd, 2011, then please consider this email is a notice to freeze all activity, else.

By this coming Wed July 13th, I must have the following:

- 1) Completed Storyboard document revised by both Tech-vendor and Tech-partner. IT is not obligated to its content.*
- 2) Prototype that shows all requested development in both portal and Workflow.*
- 3) Complete roadmap for the remaining work including deployment and post implementation support.*

Failing to deliver the above as requested, I will send to the Tech-vendor executives on Wed July 13th an official email with freeze notice and I will stop from my side all activities including the IO exercise.

I urge all to take corrective measures to streamline this endless cycle as we have other important issues in life."

8.4.3.2 Responding to senior management

The IT senior management had undermined the project in two main ways. First, the agreement was not signed with the tech-vendor. Second, the VP used to assign new tasks to the consultant undermining project activities.

First, despite the fact that those agreements were only managed by the VP, the consultant had an access to influence the VP decision. The consultant was aware of the agreement details with the vendor and was involved in the agreement negotiations meetings. The consultant was not ready to accept the failure of the agreement extension. Therefore, he tried to influence the VP decision to extend the agreement. The consultant attempts continued until he managed to convince the VP to extend the agreement. The consultant viewed the extension of the agreement as an empowerment for his position in the project.

"Consultant: *I told the VP to sign a one-year agreement but he did not accept the suggestion. I told him that we are not ready for not signing. Our departments did not do their work and we have no other option but using Microsoft's products. If they audit us they will have the right to sue us especially since they got all the information about used licences from the operations contractor. Today,*

I talked to the VP again several times about this issue. It seems that he has started to listen now. I'm trying to buy us one year to help organising the IT. The VP said that he will listen to the Tech-vendor on Tuesday meeting."

On the other side, the consultant would accept new assignments regardless of the available time for handling both the new and the existing assignments. The consultant was not worried about his extensive involvement in many activities. All his worries were about losing his close relationship with the VP. The consultant assumed that this close relationship helped him in fulfilling and responding to all the given assignments. Mainly, he hoped to have more assignments in a condition of not leaving his position next to the VP. The consultant was worried about losing his position and the good relationship with the VP.

"The consultant added that he was assuming that VP IT was agreeing on a change in his position. The consultant hoped to be given more responsibilities next to whatever he used to have. The consultant was worried that the VP wanted to move him to report to someone else."

Accordingly, the consultant accepted all new assignments following a re-skill mode where he tried to maintain his existing close relationship with the VP where he was directly reporting to him and receiving his support. That close relationship enabled him to influence the VP decisions in a way which would empower his signification of the project.

8.4.4 Reflexive monitoring challenges

8.4.4.1 Team members challenges

As explained previously, over-estimating project manager's knowledge and ignoring the contribution of other project members is considered to be one of the challenges facing project learning (Williams 2003).

During the paperless project, the tech-vendor manager was interested in facilitating the negotiation of the agreement extension. He tried to secure a meeting with the VP but the request was declined. The manager did not discuss his goals with the consultant. They were considered to be out of the project scope while they were noticed to leave an effect on the project where the manager did not attend the project meetings after the meeting request with the VP was not supported by the consultant. The consultant knew about the tech-vendor manager goals but he ignored them.

On the other hand, the consultant was worried that the failure of extending the agreement could risk the continuation of the project but he did not share those worries with the team members and tried to speed the work and complete the project before the expiry of the old agreement.

The consultant had the freedom to suggest any changes to the project goals. Sometimes, those changes were assumed to be not applicable. However project members did not reject his changes and accepted all the changes to satisfy him.

When the tech-partner realised that a change was not doable, the business analyst stopped him from rejecting the change and preferred to take the change and try implementing it.

"The consultant suggested that a photo could be utilised in the portal design. This photo was part of an old organisational marketing campaign. The Tech-Partner developer had doubts that this photo can be used but the business analyst said that they would check to see what the graphics designer could do."

In summary, project members were limited in sharing their ideas and worries with the consultant. Exchanging information between the project members was constrained by the ongoing negotiation between the tech-vendor and the organisation. Being in two different sides of the negotiations, left an effect on what information could be shared. Personal goals of each side were not shared or discussed openly. On the other hand, trying to satisfy the consultant limited the freedom of project members who avoided conflicts with the consultant and did not share any opinions which he would not prefer to hear. The limited information exchange did not enable project members to create a common shared project signification which would facilitate the structuration of the project.

8.4.4.2 Organisational challenges

Organisational support is assumed to facilitate project learning where project required resources are allocated to facilitate learning. Moreover, organisational

support includes the ability of the organisation to reflect upon the information generated by projects.

In the paperless project, the consultant had a good access to the VP where the consultant was able to call the VP to participate in project activities and to share his views with project team members. This enabled the project team to hear from the VP about the outcomes which he would be expecting out of the project.

"VP: The point we are trying to do is to reduce the number of systems we login in. Every day in the morning, I have to login into six different systems with six different user-ids and six different passwords. This is a nightmare. I cannot afford adding another system with another user-id and password."

The consultant continued exchanging information with the VP during the course of the project. That helped the consultant to ask for senior management support and to receive that support.

"At this moment the VP was leaving his office. The consultant disappeared for a long time following the VP. Then, he returned.

Consultant: *I have good news for you (project team). I told the VP that we need to upgrade the exchange server to unlock the features of the portal and he has given me his approval. He asked me to include the subject in this Sunday's executive meeting to discuss the issue with concerned departments and to ask them to start preparing for the upgrade immediately."*

The VP participation showed the team that they were supported by senior management, and in specific, showed that support to the tech-vendor. It showed the tech-vendor the close relationship between both the VP and the consultant. That passed a message that the satisfaction of the VP would be reached through the satisfaction of the consultant. The bus-vendor received the message and acted upon assuring the consultant that they will seek his acceptance of the project outcomes before anyone else.

Maintaining the relationship with the senior management seemed very important to the consultant the matter which pushed him to connect the project deadlines to the IT Executives Sunday meetings.

*"**Consultant:** Next week on Sunday, I will be busy with the executives meeting from 9:30 to 11. We can meet afternoon."*

In specific, the consultant was deeply busy maintaining a relationship with the VP the matter which would take most of his time. That was affecting the consultant availability and concentration in the project. That was noticed when the consultant was not able to meet in the IT executive meetings days or when the consultant was busy with the VP on daily basis and during the project meetings.

"Again, we were interrupted several times. Every time, the consultant would go back to work on editing of the photo. Finally, the researcher realised that all these interruptions were because the VP was leaving in a business trip to London. The

researcher knew that when the VP passed by them to say goodbye. Everybody in the office wished him a safe trip."

At the same time, the consultant was busy trying to prevent other employees from having a direct access to the VP. The consultant worked on controlling the access to the VP office stopping employees from directly contacting the VP without passing by him first. Previously, the consultant managed to put some control on that access however from time to time, the VP used to break that discipline allowing people to approach him without passing by the consultant.

"The consultant was complaining about people going right away to the VP's office without passing by him.

Consultant: *But you know. It's the VP who is behind this mess. When he is free, he encourages people to come to his office. He spoils them when he is in the mood and wants to talk. I managed to fix this issue before and stopped people from getting into his office. Most of their businesses should go through me. Yes, I managed to stop them but he damaged what I had done by allowing people meeting him for any reason. Once, I made a list of responsibilities and gave it to the VP and asked him to take what he wants and leave the rest to me. He said that this could be discussed later. I'm waiting for the time when he gets his position officially then we can discuss it."*

The good relationship with the senior managers enabled the consultant to comprehend their signification of the project and to act upon this knowledge to assure their satisfaction. Meanwhile, the good relationship enabled project members to have an access to allocative and authoritative resources from outside the project context. Internally, the maintenance of the close relationship

with senior manager enhanced the team relationship giving a sign to non-organisational members that they could achieve their personal goals out of the relationship with the organisation. However, that maintenance was time consuming and caused some disruptions to the project.

8.4.4.3 Content-type challenges

Both explicit and tacit knowledge play part in project learning and are needed to be covered during project lifecycle (Williams 2003). Tacit knowledge is challenged by being not easily communicated due to complexity (Williams 2003 and uniqueness (Cooper 1994) while explicit knowledge is challenged by the quality of generated documents (Schindler and Eppler 2003).

Although the paperless project was not done for the first time and it was preceded by a previous failing project, almost no explicit content passed from the first trial to the second. The relation between the first and the second projects was limited.

Experiences gained from the previous project were only referenced twice during the project. The first time was when the business analyst suggested using a storyboard to avoid previous project failure. The business analyst assumed that the previous failure was due to a conflict between the consultant and the previous business analyst. That was not agreed upon by the consultant

who assumed that working on producing a storyboard document would limit creativity.

The second time was when the consultant wanted to build a flowchart similar to the one which was developed in the previous project. That old flowchart was given by the tech-vendor to the tech-partner who modified it and introduced it as part of the project activities.

The project team members spent a long time with each other meeting in the consultant office discussing project details. During those meetings the consultant was trying to pass what he wanted to have to other team members. The consultant did not know exactly what he wanted. He tried several times to describe the product that he was after.

The consultant looked into some examples websites developed by the tech-partner. He shared with the team members some photos to be included in the final product. However, all his efforts to articulate his view were not successful. That disappointed him when he saw the proposed design by the tech-vendor and the tech-partner.

*"**Consultant** (angrily): They (referring to Tech-vendor and Tech-partner) understand nothing. No no ... and the bar on the top of the page ... No no."*

The project suffered from a debate on the required content type in the project. The business analyst suggested the development of a storyboard document

illustrating the different cases and scenarios covered by the final product. The document was claimed to build a common understanding among all project members where it would have all the agreed upon goals specifications in the project meetings.

On the other hand, the consultant suggested the development of a flowchart representing all required rules. The consultant preferred a document which would visually introduce all project rules rather than sequentially written rules and specifications.

***"Consultant (to the business analyst):** So, you want us to use our mmm left ... is it left side of the brain? The left side is sequential while the right side is creative and innovative."*

In summary, the project did not benefit from knowledge generated from previous projects. First, it was difficult to tacitly have the same views about the reasons behind the failure of the previous project. Conflicted views about past, when not shared and questioned, led to conflicted signification about the project goals, tools and methods, deadlines and team relationship. Second, the project members had conflicted views to project content types and how to use them. Non-organisational members required project signification to quickly move from tacit to explicit. On the other hand, the consultant appreciated the progressive and iterative nature of generating explicit project signification. Accordingly, the project members did not only suffered from lack of project signification but could not agree on the way to generate it.

8.4.4.4 Spatial challenges

Project learning is not limited to post project review meeting rooms it is a natural activity which happens everywhere as part of everyday project members' daily life (Schindler and Eppler 2003). Therefore, project members should be accessible to exchange project information.

In the first two weeks of the project, the whole team except the graphics designer were working close to each other in the consultant office. They used to meet on daily basis from 10:00 to 16:00. The consultant used to work on his machine while the discussion was going on between the analyst and the Tech-partner's developer. That was valued by the consultant who was very optimistic about the project success expressing that to all team members.

That did not continue where the business analyst and the tech-partner moved to work remotely sharing the outcomes of their works over emails. The consultant did not like the tech-vendor attitude and assumed that the tech-vendor did not give the project the enough time and were not accepting to work closer to him on a daily basis. Working remotely had affected the ability of sharing tacit views and insights and pushed for accepting explicit documents.

From another side, the consultant was happy with the location of his office next to the VP. That location facilitated the relation between the consultant and the VP. Therefore, the consultant did not accept to move to another well-decorated

office because he assumed that another employee would take his current office and would have a closer office to the VP.

"Consultant: If I move to that office, next day, [an employee name] will come to take my office. I will not give him the chance to get closer to the VP."

Although the consultant benefited from working next to the VP, the location had some bad effects on the project where the consultant was repeatedly interrupted by VP visitors. That had taken time from the consultant and affected his concentration in project meetings.

The consultant left his office door open all the time. During the meeting he could see anyone passing by his office and going to the VP and he would leave meetings to go and check the reason behind an employee wanting to meet the VP. That was a cause of interruption during project meetings. Meanwhile, leaving the door open allowed employees who had requests to interrupt the meeting and discuss their requests with the consultant.

"We were interrupted by an employee who was complaining about broken data sims and another employee complaining about business trips not finalised yet."

The use of the space reflected the nature of the relationship between project members and the change in the usage of the space reflected the change in those relationships. The consultant worked to keep his close relationship with the VP. Therefore, he preferred to keep his office close to the VP office leaving the door

open to monitor the access to the VP. On the other hand, team members started by exchanging tacit knowledge in face-to-face meetings but when the conflict on content types and how project signification may be reached, the team stopped face-to-face meeting and moved to virtual presence over e-mails.

8.4.4.5 Time-related challenges

In the beginning of the project, the team members used to gather in the consultant office and all members used to have a quick access to information. That quick access ended when the business analyst and tech-partner stopped meeting in the consultant office where the consultant had trouble receiving replies to his emails.

"From: Consultant

To: Business Analyst

It has been almost a week since I sent my feedback and comments on the Storyboard document, and I assume you have it all worked out. If so, then please share with us what have you accomplished so far. I would like also to request your kind help in sharing your plans for next steps."

"From: Consultant

To: Tech-vendor manager

I am awaiting your feedback in below action items and [tech-partner] to send the revised Storyboard document."

In the beginning of the project the consultant had a quick access to information from project members who were gathering in his office. In addition he was contacting members via email after working hours. Later, the consultant lost his

quick access when the team worked remotely. Moreover, replies to his emails were delayed.

The consultant was accessible all the time on email. He would send asking for information any time of the day and he would accept to be contacted at any time.

"To: Business Analyst

I wasn't able to see the attachment referenced in your message. I am and will be available for your call any time 24/7."

The ability to respond quickly and at any time of the day was seen to reflect an interest in the work.

On the other side, the consultant was aware of the VP's schedule identifying his free time. That made it easier to approach the VP. That knowledge helped the VP consultant to more precisely choose the proper time to interact with the VP.

***"Consultant:** Let me invite the VP to get his opinion. He is free now.*

The consultant left and came back with the VP."

In summary, project members enjoyed a quick access to information in face-to-face meetings and communication over e-mails was complementing tat accessibility after working hours. The conflicted signification to the use of project knowledge type changed project communications and resulted in delays in exchanging information. Meanwhile, due to the involvement in the agreement

negotiations, project members and especially the consultant did not have the power to regulate the delays in e-mails replies. That continued till the new agreement was signed and the consultant was empowered to regulate the communication between the two organisations.

8.5 Conclusion

The paperless Project has been examined from two perspectives. First, the project internal complexities were identified. Second, the relationship between the project and the surrounding context was explained.

The project time-related complexity was limited where the project had an open deadline with no time pressure over the project. Similarly, the project did not suffer from technical and technological complexities because the project had a very direct and clear methodology from the beginning where the project was initiated to utilise one of the tech-vendor's products and no other alternatives were considered. Meanwhile, the project team was formed from different groups which worked as one group reporting to the consultant forming less organisational complexity. However, the project had higher structural complexities represented in ill-defined goals and multiplicity of personal goals.

On the other hand, the project was initiated under the management of the VP IT consultant who received a noticeable support from VP IT due to the close relationship between the two. That close relationship enabled the project to

have access to allocative and authoritative resources including the support of other organisational departments.

Despite the project was perceived to benefit from less internal complexities and a noticeable organisational support, the project complexities were changing over project lifecycle. Technical and technological complexities did not change where all project members did not see any other alternatives other than using the tech-vendor's product. That preference did not change over the project course. However, the change of project complexities was evident in both organisational and time-related complexities. First, tech-vendor manager left the project team then the business analyst followed him. They continued working on the project but not working closely to the consultant. Mainly, the business analyst did not continue to report to the consultant and demanded his approval on the storyboard document.

The tech-partner used to work under the supervision of the business analyst. However, that changed and the consultant managed to open a direct communication channel with the tech-partner founder and request the development of a prototype.

Similarly, the project was subject to an increasing time-related complexity where the project was under time pressure resulting first from the approaching expiry of the agreement between the tech-vendor and the organisation and second from the IT senior management demands to see the outcomes of the

project. Time pressures were realised within the project context when the consultant used time pressure to regulate the tech-vendor actions assigning a deadline which if not met the project would be terminated.

On the other side, the project was not isolated from the surrounding context where the project context was undermined by the vendor and IT senior management actions. First, the tech vendor manager left the project team when he realised that the project did not facilitate the agreement negotiation. Second, the business analyst undermined the project idea of developing a prototype and called for developing a storyboard document containing all project goals specifications before heading to implementation. The business analyst undermined the consultant view and role as a project manager. Similarly, IT senior management undermined the project context first by not considering the effect of the agreement negotiation on the project. At the same time, IT senior management assigned other tasks to the consultant undermining his involvement on the project activities. In general, the project witnessed conflicted signification between the consultant and both the tech-vendor and senior management.

Responding to the undermining actions resulting from conflicted significations from the vendor and IT senior management, the consultant had taken different modes. First, the consultant followed a re-appropriation strategy where he did not accept the exerted undermining actions. The consultant did not accept to

facilitate the tech-vendor manager agreement negotiation and did not accept to end the agreement as wanted by IT senior management. The consultant called for a one-year extension which would enable the organisation to arrange for the termination of the agreement and the project to end before the expiry of the agreement.

Similarly, the consultant did not accept to fully accept the storyboard document (freezing of project goals signification) and amended more details and specifications to the proposed document. Second, the consultant managed to empower his role as a project manager after extending the agreement. That empowerment enabled him to solely set project deadlines and threaten the tech-vendor members with terminating the project and escalating their contribution in the project to the tech-vendor senior management. The empowerment of the consultant was represented in his ability to regulate the tech-vendor actions.

Finally, project members monitored project activities to maintain their knowledgeability about the project. Project monitoring was challenged by team members, organisational, content-type, spatial and time-related challenges. Those challenges bounded project members' knowledgeability and affected their actions and responses to undermining actions. First, the project manager role was overvalued by the tech-vendor members who worked hard to satisfy his needs and avoided discussing the conflicts. Second, organisational support

was made available through IT senior management support which helped project members to obtain information and bypass organisational procedures but was time consuming. Third, the project involved a conflict on the use of different knowledge types and between preference of exchanging knowledge in face-to-face meetings or over emails. Finally, members monitoring was affected by changing from working in the same office to working remotely the matter which resulted in delays in exchanging information.

Chapter Nine: General Discussion

9 General Discussion

9.1 Introduction

This chapter summarises and discusses the findings of the three projects in relation to the three research questions:

1. How are project complexities resulting from project internal properties (goals, method, deadlines and team relations) constructed over time and space?
2. How are the interactions between project team members and surrounding organisational and non-organisational members constructed over time and space?
3. What are the learning challenges (team members, organisational context, content types, time and space related challenges) facing project members during monitoring project activities?

Accordingly, this chapter is divided into five parts. The first part describes the dynamics of the complexities encountered in the three studied projects. The second part identifies how the external context played a role in undermining the projects' local contexts and how project members responded to the undermining actions in relation to Barrett and Walsham's (1999) modes of re-skilling, re-appropriation or empowerment. The third part examines the

challenges facing project members in maintaining their knowledge about project activities. Finally, the fourth and the fifth parts present the structuring of the three projects introducing key observations.

9.2 First Part: Project Complexity

9.2.1 Structural Complexity

Structural complexity (Baccarini 1996) is one of four project complexities. It is a result of multiple interrelated goals and may increase due to ill-defined goals, personal goals and changing goals.

9.2.1.1 Ill-defined goals

The literature suggests that project success is positively correlated with the development of clear goals (Dvir et al. 2003), citing clear goals as success criteria as well as success factors (White and Fortune 2002). According to this literature, clear definition of goals is used to unambiguously define project success and at the same time it helps projects to reach a successful end. Well-defined project goals are assumed to have a better effect on project performance than the 'do your best' type of assignments (Locke 1968 cited in Gray 2001). In this study, the first and the third projects suffered from ill-defined goals. Two reasons were behind having ill-defined projects.

In the first project, project goals were stated by IT senior management who did not give enough details and specifications to clearly define project goals. Project

members did not like to work with ill-defined goals and tried to extract more details in order to clarify project goals but their attempts failed. In the third project, ill-defined goals were a choice of the project manager who preferred to delay the explicit definition of project goals, wanting to allow them to improve and advance over time. The project manager suggested the use of a prototype in an iterative process of defining project goals to help produce a better final product in line with the notion that a prototype can be used as a tool to reduce disappointment after project completion (Alter 1979).

9.2.1.2 Personal goals

Projects are commonly characterised as multi-objective with conflicting goals (Williams 1999). One of the reasons behind the multiplicity of conflicting goals is associated with the need to include different sets of personal goals (Briner and Geddes 1990, Kliem and Ludin 1995 cited in Gray 2001).

Personal goals were inserted to the studied projects by different parties. In the first and the third projects, personal goals were identified as being added by project members. In the first project, the senior developer had a personal goal of obtaining access privileges from IT senior managers. That personal goal was an old goal for developers from old projects. Meantime, the project manager had a personal goal of utilising a specific development tool which was a failing goal of another project, which at the same time was perceived to be a goal of IT senior management who needed to benefit from different IT assets. In the third

project, a personal goal was inserted by the project manager involving the satisfaction of IT senior management.

Two personal goals were also inserted by contractor and vendor in the second and the third projects. In the second project, the contractor had a goal of avoiding payment deduction where the contractor participated in that project instead of other undelivered services. In the third project, the vendor had a goal of extending the agreement with the organisation and the project was used to reach and convince IT senior management with the benefits of their products.

In summary, personal goals, inserted by organisational employees were related to IT senior managers. Personal goals involved obtaining resources from senior managers or satisfying their needs by responding to their request and proving that they deserve IT senior managers' support. On the other hand, personal goals inserted by contractor and vendor were concerned with maintaining the overall relationship with the organisation either by avoiding payment deduction or extending the agreement.

9.2.1.3 Dynamic goals

Project goals are not assumed to be static and fixed during the project lifecycle. They change due to the nature of the development process which is a very uncertain process requiring room for improvisation, flexibility and iterations (Eisenhardt and Tabrizi 1995). Project goals should reflect newly available information assuring that project deliverables continue to be beneficial after

project completion (Turner and Cochrane 1993). All three projects had witnessed changing project goals during the project lifecycle.

In the first project, project goals changed from time to time where IT senior managers had access to project goals and changed them. Meantime, due to the ill-definition of project goals, project members negotiated the details and specifications of project goals. In the second project, old goals did not disappear and continued to be centre of negotiation and compromise through the project lifecycle. In the third project, project goals were left open for modification over the project lifecycle that continued until the production of the storyboard document.

9.2.2 Technical and Technological complexity

Technical complexity is linked to the number of interrelated tasks involved in the applied method (Jones 1997) while technological complexity is linked to the number of interrelated inputs involved in each task (Baccarini 1996).

Continuous and rapid changes in technology can be expected to increase methods' uncertainties (Williams 1999) while uncertainties in applied methods can be expected to add to project complexity (Turner and Cochrane 1993), and, more specifically, to technical and technological complexities. Therefore, it is recommended that projects eliminate or reduce the complexities associated with project methods by using milestones and baselines which help projects in reaching a freeze stage as early as possible (Turner and Cochrane 1993).

In this study, the third project had a well-defined and fixed technology during the project lifecycle where all project members, vendor and senior management had agreed on the technology to be used. In contrast to this, the first and the second projects had witnessed changes in technologies used.

In all projects, the technology used was tightly linked to project goals, where the implementation of a specific technology was part of project goals. Therefore, project methods were affected by changes in project goals, and project goals were affected by project methods. Using the new Mobile Development technology was part of the project manager's personal goals in the first project. In the second project, when the contractor faced a problem with the implemented technology, the contractor proposed a change to project goals.

In the first project, project members had the choice of avoiding technical and technological complexities associated with implementing a new technology. However, the project manager assumed that the project had the ability to manage the complexities of using a new technology. Other project members did not agree with the project manager and did not want to take the risk of managing new technical and technological complexities. Accordingly, eliminating or handling technical and technological complexities was debated between project members.

In the second project, integration between different technologies was required but each participating group was only experienced in one of the technologies

used. Consequently, integration among the various groups was a necessary condition for applying the chosen technologies. Therefore, managing technical and technological complexities was highly related to the integration among project groups.

9.2.3 Organisational complexity

Pinto and Kharbanda (1995) consider defining team structure, effective team building and motivating personnel to integral to project requirements just as much as acquiring resources, planning and monitoring progress. Applying project management methods is not sufficient for assuring project success in cases where forming project teams and selecting the right people with the right skills play a key role in project success (Ayas 1996). Accordingly, project success is assumed to be dependent on the effective integration of project team skills and experiences.

Teams' relations are considered to be a source of organisational complexity (Baccarini 1996) which is due to the interdependencies between participating groups and members. Meantime, organisational complexity is a result of horizontal and vertical differentiation (Baccarini 1996). With horizontal differentiation complexity is a result of the number of units and departments, while for vertical differentiation complexity results from the depth of the hierarchy.

Different levels of organisational complexities were identified in the three projects. The first project had a simple organisational structure where project members were formed from a single group, thus reducing organisational complexity due to horizontal differentiation. At the same time, all project members reported directly to the project manager thus reducing organisational complexity resulting from vertical differentiation.

In contrast to this, the second project had a higher organisational complexity. The number of participating groups and specialities increased horizontal differentiation. Vertical differentiation was also increased as each group had its own manager to whom its members reported. Thus organisational complexity increased due to the increasing interdependencies between project groups and members.

In the third project, organisational structure also consisted of various interrelated groups with different specialities. However, all group members worked as one group and reported to one project manager eliminating vertical differentiation.

Despite the different levels of their organisational complexity, all three projects suffered from team relations conflicts and problems in integration between project members. The literature advocates managing complexity resulting from team relations conflicts through integration involving coordination, communication and control (Baccarini 1996, Williams 1999)

The first project suffered from a conflict between the senior developer and the project manager due to conflicting views about project deadlines and methods, arising from differences in their personal goals. The conflict was resolved by other project members who found a compromising solution.

On the other hand, the second project had started with a higher organisational complexity which resulted in a slow communication channel and a longer follow up process where exchanging information between the two groups was slow. To resolve the communications delays, a request was made to have a single point of contact to be shared between the various groups. However, this did not help the project to manage the increasing organisational complexities because the assigned contact representatives did not cover all needed specialities. To reach the required specialities, the contractor communicated with the needed groups unofficially and without the project manager's knowledge and approval. This increased the conflict between the contractor and the project manager, increasing the project's organisational complexity.

Whilst the organisation of the third project may have been expected to minimise complexity, it witnessed different conflicts between the project manager and vendor's members. First, a conflict happened between the project manager and the vendor's manager because the project manager did not consider the vendor manager's personal goals and did not facilitate the extension of the agreement between the two organisations. Second, a conflict

occurred between the project manager and the vendor's business analyst because of conflicting views towards project deadlines and goals. To resolve those conflicts, the project manager replaced the vendor with one of the vendor's partners who could not completely replace the vendor.

9.2.4 Time-related Complexity

Project management is prescribed as a way of generating knowledge and controlling progress towards goals within time limits (Lindkvist et al. 1998). The deadline is commonly used to formulate a project success criterion: to be considered successful a project must not be allowed to exceed its deadline (Lundin and Söderholm 1995). However projects are often challenged by time pressures due to external factors where projects timelines change to be tighter with a tendency to reduce time to market (Williams 1995) in the face of competition (Williams 1999). Internally, projects are found to be challenged with increasing time-related complexities because of continuous negotiation and changes of project deadlines among project members during the project lifecycle (Manning 2008).

All three projects were found to be related to other projects or events. The relations with these projects and events exerted time pressures on observed projects. The first project was related to a competing project therefore the project was supposed to complete before the competing project. The second project was complementing another project executed by the same project

members therefore the project was supposed to meet the deadline requirement of that project. The third project was related to the extension of the agreement between the organisation and the vendor; accordingly the project had to be completed before the expiry of the old agreement. In all projects, the relation with external projects and events resulted in time pressures on the studied project.

In both the second and the third projects external time pressures did not translate into an understanding that the project timeline would be tight: project members perceived the exerted time pressures as relaxed deadlines which did not put pressures on projects. Only the second project which was complementing another project for the same group was timeline perceived to be tight.

Other time pressures were set by IT senior management in all three projects. Time pressures exerted by IT senior management had taken different forms. In the first project, the VP set the deadline as a project success criterion such that if the project did not meet that deadline it would not be accepted by IT senior management. In the second project, IT senior management time pressures manifested themselves when the project was delayed: senior management did not support time extensions and recommended project termination. In the third project, IT senior management time pressures were introduced as inquiries

about project status by the VP. In all cases, project members felt that IT senior management put time pressures on the studied project.

Different techniques were adopted to manage time pressures in the three projects. In the first project, an establishment of sub-deadlines was adopted. The definition of sub-deadlines was highly connected with project goals which in turn were connected with project members' personal goals. Therefore, conflicts in personal goals led to a conflict about sub-deadlines.

On the other hand, an open deadline policy was used in the third project. Again the open deadline policy was related to project goals where the project manager used the open deadline policy when project goals were not defined. When the project goals were explicitly defined, the project manager changed to applying a strict timeline policy. At the same time, the open deadline policy was allowed while project members were working next to the project manager on daily basis and offering full time dedication to the project.

9.3 Second Part: Interactions with the Surrounding Context

9.3.1 Relationships between project and surrounding context

In the first project, the relationship between project members and end-users was maintained through extensive "pre-project partnering" (Larson 1997). This partnership was maintained over time from one project to another. The literature advocates making pre-project partnering formal and institutionalised,

avoiding a simple handshaking (Jiang et al. 2002). In contrast to this, in the first project the partnership between project members and end-users was not formal: it was used to bypass the delay and complexity of formal relationships. The project members had unofficial access to available resources and to end-users. At the same time, end-users bypassed the formal process of raising problem requests to receive technical support.

Despite the pre-project partnership between project members and end-users, IT projects were threatened by the relationship between end-users and external vendors where end-users would skip IT's role, products and capabilities to communicate directly with vendors. In the face of such a threat, senior management can be expected to focus on creating an organisational environment enabling projects to be successful (Gray 2001). Accordingly, the IT senior management had reshaped the threatening relationship between end-users and vendors where end-users were asked to communicate with vendors through the IT who would be responsible for making agreements and signing contracts with vendors.

Internally, senior management support is expected to enable projects to gain organisational support and help in avoiding non-productive activities dealing with other organisational departments (Johns 1999). Helping projects to gain organisational support was only observed in the third project where the project manager used to inherit the VP power and authorities. The close relationship

between the project and IT senior management offered the third project an easy and quick access to support and services from other IT departments.

Organisational support enabled the project manager to bypass IT rules and policies. However, organisational support was not absolute where some departments viewed the IT senior management support to constrain and limit their technical choices and freedom.

In the first and second projects, IT senior management did not offer the same support. In the first project, IT senior managers were closely interacting with end-users and external vendors. Those interactions were reasons for conflicts between IT senior managers and project members especially when senior managers pulled members from projects to work on different tasks serving end-user requests. Conflicts between senior management and project goals are cited as being behind the productivity paradox (Dos Santo and Sussman 2000) and project failure (Gray and Larson 2003).

Furthermore IT senior management did not share the results of their interactions with end-users and vendors with project members who therefore did not realise their role when dealing with end-users or vendors. This ran contrary to the recommendations that senior management should produce a clear policy supporting project members' authorities and spreading a message empowering project teams (Johns 1999).

Similar to the first project, IT senior management support was not evident in the second project where IT senior managers did not share with project members the details of the contract with the contractor, did not clearly define the authority of project members and did not define the relationship between the project and the contractor. Ambiguity of the rules regulating the contractor's actions resulted in project members mistrusting the contractor.

Finally, in the third project, IT senior management was found to help in gaining organisational support, they even helped in bypassing organisational rules and procedures. Meanwhile, projects without senior management support were able to obtain some organisational support through their historical relationships with other organisational departments: those project members familiar with other organisational departments' requirements were able to reach an agreement with them and obtain organisational support. However, organisational support offered by other departments was limited and would reach a stage requiring senior management support.

9.3.2 Surrounding context undermining project context

In the first project, IT Senior managers were involved in defining project properties where they had an access to set project goals and deadlines. At the same time, IT senior managers were also involved in shaping the relationships between project members with vendors and end-users.

IT senior managers had undermined the historical relationships between the project and end-users, establishing a direct relationship between project members and the vendor. The vendor members were not familiar with project members and so they dealt with the project team in a similar way to how they used to deal with end-users, thus undermining project members' technical role. In addition, end-users undermined the project context and previous project activities: end-users defined project goals and did not allow the project team to change how they would interact with external vendors.

During the project, IT senior managers changed their attitude to the project from time to time. IT senior managers did not allow project members to define project goals and deadlines independently. Initially IT senior managers started defining project goals and deadlines, and then they introduced the vendor to jointly define project goals and deadlines with project members, undermining project members' relationship with end-users. Finally, IT senior managers changed their approach and asked project members to follow end-users on defining project properties.

In the second project, IT senior managers were not involved in defining project properties which were left to be negotiated by project members, contractor and other organisational departments. During the second project, the contractor did not respond to organisational and project requirements to define task deadlines. As explained in chapter five, the contractor managed to adapt

different techniques to avoid defining a specific deadline for the contractor's activities. The project manager could not regulate the contractor's behaviour, and similarly the organisational departments concerned could not force the contractor to commit to a specific deadline.

During project activities, the contractor did not commit to the project manager's requirements which were mainly based on meeting another project cutover date. The negotiation was not only centred on defining project deadlines but extended to cover project goals: the contractor's engineers produced a final product undermining the agreed project goals.

The project was not only undermined by the negotiation between the project and the contractor where IT senior management had played a role in directing project activities. IT senior management did not leave the project open ended. Consequently the VP recommended that the project manager terminate the project if it was not completed as agreed. IT senior management thus put pressures on the project to be terminated.

Finally, although the third project was supported by IT senior management, IT senior managers were not directly defining project properties. Defining project properties was left to the project manager and the project team. Project properties were subject to negotiation between the project manager and the vendor. The negotiation was affected by the negotiation of the agreement extension between the organisation and the vendor.

In the beginning of the project, the vendor had supported the project manager and showed an acceptance of his views and requirements in the project.

However the vendor manager's attitude changed when the project manager did not give enough support to the vendor in ongoing negotiation. The troubles facing the negotiation of the agreement extension affected the activities of the third project, with the vendor undermining project activities. First, the vendor's manager and the business analyst discontinued their attendance at project meetings in the project manager's office. At the same time, the business analyst stopped accepting the project manager's views about the project: the business analyst did not agree to continue working according to an open deadline policy and did not accept to use a prototype. The business analyst wanted to start by explicitly defining project goals in a storyboard document and then developing a project timeline. In general, the vendor undermined project goals, deadlines and the role of the project manager in managing project properties.

Despite the IT senior management support for the project, it was observed that the IT senior managers' actions had affected and undermined the project context. First, the delay in extending the agreement with the vendor had played a role in shaping the vendor members' undermining actions where it was believed that the vendor's manager and business analyst were influenced by the troubles which faced the extension of the agreement. Second, IT senior managers continued assigning other tasks to the project manager: this

undermined project activities and sidelined the project manager's involvement in the project.

9.3.3 Responding to undermining actions

According to Barley and Tolbert (1988), social actions are categorised into three modes: maintenance, elaboration and modification. Similarly, Barrett and Walsham (1999) state that responding to undermining actions involves three different modes including re-skilling, re-appropriation and empowerment.

As introduced previously, IT senior managers had played a role in undermining project activities. Mostly, project members had accepted all senior managers' undermining actions. First, project members accepted IT senior managers' definitions of project goals and deadlines. Second, they accepted IT senior management requests to include and exclude external parties to participate in the project. Third, the project manager followed the VP's recommendation to terminate the project. Finally, project members accepted other assignments from IT senior managers during project activities.

IT senior managers' actions were perceived to undermine project local practices and *deskill* (Barrett and Walsham 1999) project members, changing project local context. Project members accepted the changes exerted on the projects by IT senior managers and acted based on the new changes responding

in a *re-skill* mode and maintaining the continuation of the system according to the IT senior management changes (Barley and Tolbert 1988).

Meanwhile, IT senior management actions did not completely set project goals, deadlines and methods and they did not define the projects' relations with end-users, vendors and contractors. Project members had the chance to act based on their experiences and knowledgeability with the project local context in a *re-appropriation* mode.

Finally, project members had approached IT senior management for *empowerment*. However, senior managers had responded in different ways relative to the given support and the involvement of senior management in the project. The third project was the only project receiving senior management support. The first and the second projects did not receive any noticeable senior management support.

In the first project, project members looked for the empowerment of IT senior management but the support was conditional where IT senior management stated that they would support the project if the project managed to meet the specified deadline. Accordingly, IT senior management support would be in accepting the final project product. In the second project, project members needed IT senior management support to regulate the relationship with the contractor. However, the requested support was not given and the project manager was recommended to terminate the project if the required product

was not produced immediately. In the third project, the project manager managed to receive the required empowerment through communicating with the VP and facilitating the extension of the agreement.

At the same time, the observed projects were undermined by end-users, vendors and contractors. Mostly, project members did not accept the undermining actions but they used their knowledgeability, skills and experiences to elaborate (Barley and Tolbert 1988) the undermining actions in a *re-appropriation* mode.

In the first project, project members did not allow the vendor to undermine their technical role in the project but they were not empowered by IT senior managers. Therefore, project members were involved in a re-appropriation mode where they re-shaped the project to be a competition with the vendor. At the same time, the project manager did not accept to completely follow the end-users where project members found a technical role in the project and produced an iPhone application to serve the end-users.

In the second project, the contractor undermined the project manager. First, the project was undermined by not specifying a deadline and second, by changing the project goal. In the face of the undermining actions, the project manager looked to the IT senior manager's for empowerment but it was not granted. The project manager had two choices: to terminate the project or to accept the contractor's changes to the project. The project manager chose to agree with the

contractor's changes to complete the project successfully in a re-skilling mode. However that choice was not viable because the contractor failed to continue implementing the undermining actions. Therefore, the project manager decided to follow the IT senior manager's decision terminating the project as a failing project.

In the third project, the vendor undermined the project. First the vendor's manager undermined the project activities when he stopped attending the project meetings. Then, the business analyst undermined the project open deadline and goals policy. The project manager used a re-appropriation mode responding to the vendor's undermining actions. First, the project manager did not accept the vendor's changes. He did not agree to support the vendor's manager in his attempts to extend the agreement between the two organisations. Second, he did not accept the business analyst's prescription to develop a storyboard document and then set a deadline. Instead the project manager substituted the business analyst with the partner. The re-appropriation response by the project manager continued until the project was empowered by IT senior management.

9.4 Part Three: Reflexive Monitoring Challenges

All project members are involved in reflexive monitoring of the outcomes of actions which is a feature of everyday activities (Jones and Karsten 2008). Reflexive monitoring enables individuals to maintain their knowledgeability

with social structures (Giddens 1984). In the project context, it enables project members to maintain their knowledgeability with project activities, informing their future actions. As discussed earlier, reflexive monitoring in projects can be challenged by different factors related to team members, organisational context, content-type, space and time.

9.4.1.1 Team members challenges

It is assumed that learning in projects is hindered by overestimating project manager knowledge and not giving the same attention to other project members (Williams 2003). Overestimating project manager knowledge is a feature of the way in which project managers are given the responsibility to harvest project knowledge and generate reports containing gained experiences (Schindler and Eppler 2003).

However, learning is not limited to post project reviews. Learning is part of all project phases (Pitagorsky 2000) where all members are involved in monitoring project activities. Therefore, overestimating project managers' knowledge can be due to only considering monitoring project managers whilst ignoring the insights and views generated by other project members. Different levels of appreciating project members' knowledge was observed in the three projects.

In the first project, project members' knowledge was welcomed. That covered all project members including the project manager, the senior developer and

junior developers: all members were allowed to contribute in defining project goals, methods and sub-deadlines.

On the other hand, in the second and third project, project members' contributions were marginalised. In the second project, information was not shared with project members, and this limited members' knowledgeability and consequently their members ability, to act: project members were simply acting based on what they were asked to do by the project manager. At the same time, project members did not share their opinions and views with the project manager because they assumed these would be ignored and thus they did have any effect on project properties and activities. This is consistent with Schindler and Eppler's (2003) finding that post-project debriefing is hindered by members' unwillingness to learn, or their realization that there is no personal gain from debriefing.

Similar to the second project, the third project was characterised by a limited contribution of project members in defining project properties. Project members were interested in satisfying the project manager in order to gain his support in the extension of the agreement between the two organisations. Extending the agreement was a personal goal of vendors' members: accordingly they did not want to be involved in conflicts with the project manager.

Additionally, in the first project, it was observed that giving project members the freedom to participate in shaping project properties and activities had

resulted in conflicts between project members. However, that conflict was a temporary conflict which was solved by project members themselves.

At the same time, it was observed that in their monitoring of project activities, members seek to obtain information. When needed information is not shared, members refer to available information from unofficial channels. In the second project, project members substituted the missing information about the project with unofficial information received from colleagues from other departments about the attitude of the contractors. That collected information influenced a view that the project manager was not empowered enough, that he needed IT senior management support, and that any actions from project members would not be useful. Similarly, in the second project, the contractor was not given technical information about the Portal environment, and therefore they established an unofficial channel with the other contractor. That was considered as a leak of information which resulted in a conflict between the project manager and the contractors.

In summary, project members' sharing of generated knowledge out of the monitoring of project activities was required for the progress of project knowledge. Knowledge sharing can be encouraged by allowing all project members to receive available project information, for example by making it public (Raelin 2001). Doing so encourages participation of all team members in generating project learning (Lindkvist et al. 2002) and solving project problems.

However, in this study project members' contribution to solving project problems was challenged by different issues. First, project members were not able find the required information. Second, project ability was affected by sharing unofficial information away from the project manager. Third, the project was challenged by members' unwillingness to share knowledge because of their perception that they would not influence project activities. Finally, personal goals were observed to affect project members' knowledge generation and participation in the project.

9.4.1.2 Organisational challenges

According to CHAOS report (cited in Jiang et al. 2002), senior management support is assumed to be one of top three drivers for project success. Senior management support is cited as a project success factor (White and Fortune 2002) and is expected to create an organisational environment which is conducive to project success (Gray 2001). Senior managers help projects to gain organisational support, preventing projects from wasting time and resources dealing with other departments (Johns 1999).

The first and the second project suffered from missing senior management support. In the first project, senior managers had access to project properties and had the power to set project goals, deadlines and relationships with external groups. Accordingly, senior management support was expected to be in

aligning project goals with senior management goals through exchanging information. Senior management support to clarify project goals helps in avoiding 'productivity paradox' (Dos Santo and Sussman 2000). However, IT senior management did not share the agreement regulating the relationship between the organisation and external vendors with project members, and they did not empower project members in their relationship with vendors.

In the second project, senior management was not involved in defining project properties, but the project was initiated to complement another project for the project team. During project activities, senior managers were called to empower project members in their relationship with the contractor. However, their call was not answered and the VP recommended that project members terminate the project. The literature warns against senior managers mistrusting project members because it is negatively correlated with project success (Gray 2001). However, in the second project, the GM mistrusted project members and isolated himself from the project members, even to the extent of ceasing to communicate directly with them when feedback about project status was needed.

In the second project, the GM enabled the project to start receiving organisational support from other organisational departments. Later, senior managers stopped communicating with the project and stopped supporting the project. However, organisational support continued and was not interrupted by

the cessation of senior management support. Thus, whilst senior management support helped in starting organisational support, it was not necessary for its continuation. Organisational support helped to partially regulate the relationship between the project and the contractor and helped the project manager to receive replies to his enquiries from the contractor.

In contrast to the first and second projects which were missing senior management support, the third project benefited from good access to senior management support. Senior managers were easily accessible to the project manager. The VP was contacted and he participated in project activities. The VP enabled the project to benefit from organisational support. Meanwhile, senior management support enabled the project team to bypass organisational procedures and routines. However, maintaining the relationship with senior management was time consuming.

In summary, senior management support was needed to empower project members in their relationships with end-users, vendors and contractors. Empowerment, in this context, entailed sharing information about the contracts and agreements with vendors and contractors and the direct involvement of the senior managers to regulate the relationship between the project and external parties. Whilst senior management support might be needed initially for acquiring organisational support, once acquired organisational support could be maintained without continued support from senior management. Senior

management support could help in receiving organisational support and bypassing those organisational procedures perceived to be constraining and limiting to project activities (Johns 1999). Finally, senior management support is represented in the continuous communications and exchanging of information between the project and senior management. Exchanging information was shown to be important both, for project members to avoid 'productivity paradox' (Dos Santo and Sussman 2000) and to obtain organisational support (Johns 1999). Finally, maintaining senior management support was observed to be time consuming.

9.4.1.3 Content-type challenges

Project knowledge includes tacit and explicit knowledge, thus effective project learning is assumed to cover both explicit and tacit knowledge (Williams 2003). The literature recommends utilising knowledge management tools to maintain project knowledge (Ruggles 1998) but this is considered to be insufficient if project complexity is not addressed (Williams 2003). Project knowledge generation may be hindered in different ways depending on the type of knowledge involved. First, difficulty of communicating tacit insights and experiences gives rise to difficulty in articulating project complexity (Williams 2003) or uniqueness (Cooper 1994). Second, explicit knowledge may not be generically documented and written in a way that understandable, accepted by all members, and avoids the 'not invented here' syndrome, thus hindering

knowledge sharing across different project contexts (Schindler and Eppler 2003).

The three projects differed in their use of tacit and explicit knowledge. The first project relied heavily on face-to-face meetings. The second project relied predominantly on communications over emails. Finally, the third project started with face-to-face meetings then moved to rely on emails. In the three projects, project members faced various challenges dealing with tacit and explicit knowledge.

In the first project, project members relied heavily on face-to-face meetings and communications with senior managers and vendors were conducted face to face. Project goals were obtained from the VP's pronouncements during quick meetings. However, project members faced a problem in clearly understanding IT senior managers' goals where insights and experiences were not communicated easily (consistently with Williams 2003). To resolve the difficulties in communications between senior managers and project members, rather than request explicit knowledge project members called for more face-to-face meetings with IT senior management. In the same vein, whilst the project manager could communicate with the vendor via email, he preferred to have more interactive communications with them. Similarly, project members preferred to have an interactive communication channel with end-users. Notably, although the project did not often use explicit documents, project

members did express a need to have the agreement document regulating the relationship between the organisation and the vendor, but the agreement was not ever shared.

The second project relied heavily on communicating via email. Email was used to exchange information officially. Verbal and face-to-face meetings were used unofficially: they did not affect project goals and deadlines directly but they were used to prepare for exchanging an official reply over email. Project members were differentiating between exchanged information based on its type where they needed to document the commitment to deadlines and project goals by the contractor.

The third project went through two distinctive phases: it began with heavy usage of face-to-face meetings, and then project moved to use email as a main communication channel. During the first period, communicating insights and views ran into difficulties where the vendor could not comprehend the project manager views and commends. Regardless of the long face-to-face meetings, project members could not share the same views. With regard to seeking better articulation of members' insights, project members were divided in two groups. The vendor was in one side calling for generating a storyboard document. On the opposite side, the project manager suggested articulating the generated insights in a prototype. The project was based on the failure of a previous project. However, it was found that the project did not benefit by learning from

the failing project because reasons behind the failure of the previous project remained tacit and were not agreed upon and no documents were shared between the two projects.

In summary, challenges existed regardless of the type of knowledge used. First the use of tacit knowledge required face-to-face meetings. Tacit knowledge was not communicated easily and so frequent face-to-face meetings were required. However these did not guarantee the success of tacit knowledge articulation where there were different ways of articulation (e.g. generating a detailed storyboard document or producing a prototype). Not reaching an agreement on the articulation method represented another challenge facing projects. Explicit knowledge was affected by being used officially to regulate the relationships during project activities. Accordingly, agreements and contracts were not shared: this prevented project members from self-regulating their relationships with the vendor without referring to senior management. Meantime, explicit replies were used carefully to avoid responsibilities by different project members including vendors and contractors.

9.4.1.4 Spatial challenges

Project learning is not limited to post project review meeting rooms: it happens everywhere (Schindler and Eppler 2003) as project members maintain their knowledge while monitoring everyday activities occurring naturally. Therefore, project learning is challenged by the inability to access project members

(Schindler and Eppler 2003). Meantime, communicating tacit knowledge requires face-to-face meetings.

The three projects displayed various effects of spatial challenges affecting project activities. The end-users in the first project were located in a different location in different side of the city in relation to the project team. To resolve that challenge, project members relied on phone calls which were preceded by a meeting providing the base of the common ground for the relationship.

Similarly, the relationship with the vendor was hindered by the special location of: the vendor was located in Nice and this limited the communication to using emails. However, the spatial challenges were not limited to obvious differences in geographical location of organisations: spatial challenges also affected the relationship between project members and IT senior management working in the same building. These challenges were associated with the inability to access IT senior managers who were frequently travelling in business trips out of Saudi Arabia or in meetings in different organisational locations. IT senior managers' offices were not accessible because their secretaries would stop employees accessing their offices. IT senior managers were only accessible when they requested employees to come to their offices. The second project faced spatial challenges became when some of the contractor members joined the project remotely and had problems communicating with project members. Communication was mainly established using emails. However, information was not easily communicated in emails and project members turned to use

conference calls. The project was hindered by the inability to handle the remotely working groups and to integrate them with the project. Travelling to have face-to-face meetings was not easy because remote members required visas to enter Saudi Arabia and this entailed a lengthy process. At the same time, the project was hindered by rotation of the contractor's employees around various locations in Saudi Arabia and India. Once contractor's employees left the organisation they were no longer accessible.

In the third project, during the first two weeks, project members used to work next to each other and this was valued by the project manager. However, that close relationship did not continue and the project team turned to working remotely. In the first period of the project, project members suffered from the difficulties of exchanging tacit knowledge. In the second period where they were working remotely, project members suffered from delays in replies. In contrast to this, the project manager benefited from working close to the VP having easy access to the VP when asking for support. This was recognised as helpful to the project. However the project manager was worried about leaving that access available to other employees and he became preoccupied with monitoring the access to the VP, periodically which was interrupting project activities.

In summary, being operating in two separated locations affected project communication channels. Resolving the geographical challenges was solved

using emails at the expense of losing tacit knowledge. Geographical separation was not the only challenge facing projects. Spatial challenges were implicated in the inability to access project members. Inaccessibility was observed mostly with senior management who were busy attending meetings in different locations or travelling in business trips, while their offices were not accessible because secretaries denied access to employees.

9.4.1.5 Time-related challenges

It is important for projects to learn from project past experiences (Collison and Parcell 2001). However learning is not limited to past projects: it is considered to be part of all project phases (Stewart 2008). Learning should not be limited to recording experiences at the end of projects, and experiences should be recorded during project lifecycle (Pitagorsky 2000), to mitigate against the possibility of losing the opportunity to learn from any project members released before project closure (Schindler and Eppler 2003). Accordingly, it is advocated that project learning is conducted continuously. According to Schindler and Eppler (2003) superficially limiting learning to a single review at the end of projects is prey to project time pressures where project members ignore learning because there is no time for learning or time is allocated for other project activities. Time pressures may affect project learning by not allocating enough time for learning whilst delays in recording experiences may negatively affect the quality of generated documents (Schindler and Eppler 2003).

In the first project, project activities were affected by time-related challenges in different ways. Mainly, project activities were conducted in face-to-face meetings. The project was affected by the frequency of meetings with IT senior management, the length of the meeting, and the time of the meeting.

In the second project, project members, were working remotely using emails to communicate with each other. Emails were delayed and this put time pressures on the project. At the same time, the project was affected by the lengthy governmental process making it difficult to invite contractor members to Saudi Arabia.

Finally, the project was affected by the demands on time made by face-to-face meetings between the project manager and contractor's members who visited the project manager after working hours. Those late visits were negatively received and perceived to be used to put pressure on the project manager.

The third project started with face-to-face meetings on a daily basis where all project members were available over the whole working day. Then, the project moved to use emails instead of face-to-face meetings and suffered from email delays. However, the very quick responses of the project manager and the partner founder using email all around the clock (even out of working hours and late at night) helped to improve the relationship between the two. Finally, the awareness of the VP schedule helped the project manager to call the VP to participate in the project and to ask for his support.

In summary, time-related challenges were evident in the three projects. Each communication channel had its own time-related problems. Using emails was affected by delays in giving replies, related to weekend differences between various locations or due to other political considerations. On the other hand, exchanging project knowledge in face-to-face meetings was affected by frequency and length of meetings and choice of the right time to holding the meeting. Finally, exchanging project information was affected by the awareness of other members' schedules.

9.5 Part Four: Structural Analysis

9.5.1 Structuration of organisational complexity

Project organisational complexity is dependent on partnerships between project members prior to the project. They involve partnerships between project members and outer organisational stakeholders as well as partnerships between stakeholders and other groups other than project members. Those historically rooted partnerships shape project activities and at the same time they are the results of project activities.

Project organisational complexity is dynamically changing during project lifecycle where it is affected by project members' actions in the project context as well as by outer interactions between various partners, which may enable or constrain project activities.

Project members are involved in negotiating project team relations. Those negotiations may involve changes to team members or changes to members' roles. Changes to team members may be a response to project needs where the involvement of experts in technology or business rules may be required. In other words, they may be a result of an agreement among project members. However, changes may undermine project team relations when they are forced on project context from the outer context undermining the shared project team relations' signification.

Internally in the project context, project members negotiate technical roles of participating members and groups. They may reach an agreement on the technical role assigned to groups and members or they may have conflicts on the assigned roles and eventually prevent them from generating a shared team relations' signification unifying project team. Similar to negotiating technical role, project members are involved in negotiating the regulating authorities of each member where project manager is not always the main regulator of project activities rather the applied regulating rules are subject to negotiation showing the nature of domination in the project.

The signification of project team relations including the assignment of technical and regulating roles may be shaped by the history of partnerships among project members and groups. Accordingly, in internal project team conflicts,

project members may refer to outer context to change project team relations calling for organisational support.

On the other hand, non-project actions in the outer organisational context may leave an effect on project team relations such as changes in the outer organisational structure, which lead to changes in internal project team relations. Project members may be affected by outer ongoing changes in partnerships undermining project context team relations following the changes in partnerships. In some cases, this involves undermining an old and historical relationship between project members such as asking project members to ignore their historically established partnership with end-users following the changes in the partnership between end-users and the IT senior management.

In summary, project members are in front of different choices where they may choose to maintain ongoing partnerships or only consider the temporal project team relations. They may use external partnerships to maintain project team relations and in other cases they may use project team relations to enhance external partnerships. Project members' choices and actions affect project progress as well as the outer context and future projects.

9.5.2 Structuration of structural complexity

Structural project complexity has shown to be dynamically changing as a result of project internal interactions and as a result of interactions with the

surrounding environment. It is dependent on project members' significations of project goals. Those significations are subject to negotiations where project members may generate a shared common project goals signification or end to adapt multiple different and in some cases conflicted project goals significations.

Goals signification is affected and influenced by project members' personal goals. Those personal goals are rooted in history and are results of project members reflexive monitoring of progresses of past projects as well as interactions in the organisational context. The negotiation of a shared project goals signification is subject to dialectic of control and the nature of domination within the project context. In other words, goals signification is linked with project organisational complexity where it is linked to members' experiences, accumulated from a project to another, and linked to team members' roles in the project, which empower them to force their significations. Accordingly, the increase in project organisational complexity leads to the increase and diversity of experiences and eventually the number of individual goals significations.

On the other hand, project goals signification is linked with other project properties significations such as project technology and deadlines. Used technology may limit or facilitate the implementation of specific goals according to technology's features and limitations. Similarly, goals signification may be constrained by project deadlines where deadlines may be set in a relaxed way

or open to allow the progress of goals signification. On contrary, deadlines may be tight putting pressures on the negotiations of project goals significations. In summary, technology and deadlines may be shaped as resources given to project members to facilitate the development of project goals signification or may be regulating rules, which constrain the process of negotiating project goals significations.

As explained previously, the negotiation of project goals signification involves negotiating the inclusion of personal goals in a shared project goals signification. Meanwhile, project members negotiate other aspects related to goals signification such as levels of goals definitions, what tools used for the generation of goals signification. Project members may choose to have very well defined project goals which are explicitly documented or they may have a tacit agreement on a set of ill-defined project goals leaving those goals to develop over project lifecycle. In either way, project members may choose different tools to help tracking their significations of project goals. Storyboard is used when project goals are clearly known and written in an explicit form. On the other hand, prototype helps in giving project members the freedom to iteratively change and develop their shared signification of project goals.

Finally, project members are faced with the productivity paradox where they are beside their relations in the project context they are involved in partnerships out of the project context. Therefore, project context may be used

to maintain those partnerships or partnerships may be utilised to facilitate project goals negotiations. As a result, existing partnerships may constrain project members' actions during goals significations negotiations or they may empower project members.

9.5.3 Structuration of technical and technological complexity

Similar to both organisational and structural complexities, technical and technological complexity is dynamic and changes over project lifecycle where it is shaped and shaping other types of project complexities.

First, technical and technological complexity is linked with organisational complexity. It is shaped following the formation of team relations and changes to them. The diversity of technology needed to implement a project calls for integration between diversity of members and groups with different technical knowledge. Meanwhile, members with technical knowledge are empowered to participate in shaping project technical signification and eventually project signification. That empowerment gives members with technical knowledge an advantage during the negotiation of project signification which is either accepted by other members and groups under conditions of trust or calling for verification in absence of trust. This verification process represents a form of regulating role.

Second, deadlines play a role in shaping the signification of project technology where deadlines may allow the development of technology signification giving more time for reaching shared technology signification or it could constrain that development regulating members' technical choices and decisions. The process of generating a shared project technology signification is subject to negotiations among participating members who are empowered by past experiences and technical knowledge but still are subject to regulation.

In the heart of technology signification negotiation comes the idea of shaping the implementation of technology as a project goal or only considering technology as a tool to implement project goals. In the case of considering technology implementation as a goal, technical and technological complexities merge with structural complexities where both types of complexities add to each other and increase project complexities. Meanwhile, besides being shaped by members' technical knowledge, technology implementation as a goal inherits structural complexity nature of being rooted in history where if a goal fails in a project it comes back to be included in future projects as a personal goal by members who want to change past failures to successes. In general, this question of considering technology as a goal or a tool represents one of the major questions, which need to be negotiated during the formation of project technology signification.

9.5.4 Structuration of Time-related complexity

Again, similar to the previously discussed types of project complexities, time-related complexity is dynamic and highly connected with other types of project complexities.

Setting project deadlines depends on team relations where either authorized members have the power to set deadlines or it will be an outcome of negotiation process among various members and groups. Meanwhile, setting deadlines is rooted in history and dependent on members past knowledge where through their experiences, they are able to estimate the amount of time required for tasks completion. It is not only up to the past experiences project members set deadlines while it is affected by the monitoring of external context where project members may take into consideration other competing projects, activities and deadlines. This shows that setting deadlines is rooted in external context as well.

As explained previously, setting project deadlines is negotiated among project participants and is dependent on team relations and the power given to project members. During the negotiation of project deadlines, project members negotiate different aspects related to deadlines, which affect time-related complexity.

First, project members need to divide the overall project deadline into sub-deadlines and they need to link those sub-deadlines to project goals and tasks. During this process, project members merge between project time-related complexity and structural complexity. The relationship between the two types of complexities is shaped as either enabling or constraining relationship. In the enabling form of the relationship, deadline is set to assure the achievement of project goal while in the constraining form, the deadline is set as a boundary, which limits and control goals signification and implementation. Deadline as an enabling property is perceived as a resource given to project members to facilitate project structuration while in the constraining form, it is set as a regulating property sanctioning project members' actions from wasting organisational resources. In both cases, project members need to negotiate project deadline signification and share an agreement on the nature of project deadlines and their relationships with project goals and structural complexity.

9.5.5 Project structuration

Project structuration progresses through the negotiation of project complexities significations and how project members share perceptions about project different types and levels of complexities: organisational, structural, technical and technological and time-related complexities. The signification of a specific type of project complexities is not away from the signification of other types of complexities rather they are tightly interrelated and interdependent. Meanwhile, members' choices are rooted in history and embedded in outer

context reflecting members' knowledgeability with both history and ongoing organisational activities.

During project structuration, project members negotiate the signification of project properties shaping the signification of the project as a whole. Through the negotiation, first, project members decide their position between shaping project team relations only to maintain and improve external partnerships with external groups or using partnerships to create project team relations in a way which is suitable for project objectives. Second, participants need to share common goals signification, which could only include project internal goals or could include other goals related to external ongoing partnerships. Third, the signification of project technology as a goal or a tool is another issue, which requires shared agreement. Finally, project members need to agree on the nature of project deadlines as a regulating rule or is given to project as enabling resources facilitating the structuration of the project. Table 9.1 and Fig. 9.1 summaries the previously explained project structuration analysis of dynamic project complexities showing the embeddedness of project structuration in time and in the external context identifying the interdependencies between the significations of the four studied project complexities.

Organisational Complexity Team relations	Structural Complexity Goals	Technical and Technological Complexity	Time-related Complexity Deadlines
Dependent on: <ul style="list-style-type: none"> Partnerships <ul style="list-style-type: none"> (Project – Outer) (Outer – Outer) Embedded and rooted in history	Dependent on: <ul style="list-style-type: none"> Team relations Changing who define goals Personal goals Rooted in history <ul style="list-style-type: none"> Technology <ul style="list-style-type: none"> Limitations – features Deadlines Fixed or Open 	Dependent on: <ul style="list-style-type: none"> Team relations Different Technologies (integration) Technical knowledge empowering Empowerment call for regulation Deadlines Relaxed – Open - Constraining 	Dependent on: <ul style="list-style-type: none"> Team relations <ul style="list-style-type: none"> Who's setting deadlines Members knowledge <ul style="list-style-type: none"> Experience Competition – dependency – ongoing events Embedded and rooted in history
Dynamic: <ul style="list-style-type: none"> Outer changes Undermining actions 	Dynamic: <ul style="list-style-type: none"> Negotiated 	Dynamic: <ul style="list-style-type: none"> Negotiated 	Dynamic: <ul style="list-style-type: none"> Negotiated
Undermining Actions: <ul style="list-style-type: none"> Technical role Changing partners (end-users) Introducing regulators Undermining old partnerships 	Negotiations: <ul style="list-style-type: none"> Inclusion of personal goals Level of goals definition Used methods of signification (Prototype – storyboard) Relations between goals and partnerships (maintain or utilize) 	Negotiations: <ul style="list-style-type: none"> Technology as a Goal (limitations – features) Rooted in history <ul style="list-style-type: none"> Technology as a Tool 	Negotiations: <ul style="list-style-type: none"> Relations between deadlines and goals (fixed – open – sub-deadlines) Deadlines as a regulating property
Maintaining project or partnership	Utilize partnership to achieve goals or maintain partnership	Technology as a goal or tool	Deadlines as a regulating property

Table 9.1: Interdependencies and embeddedness of project complexities

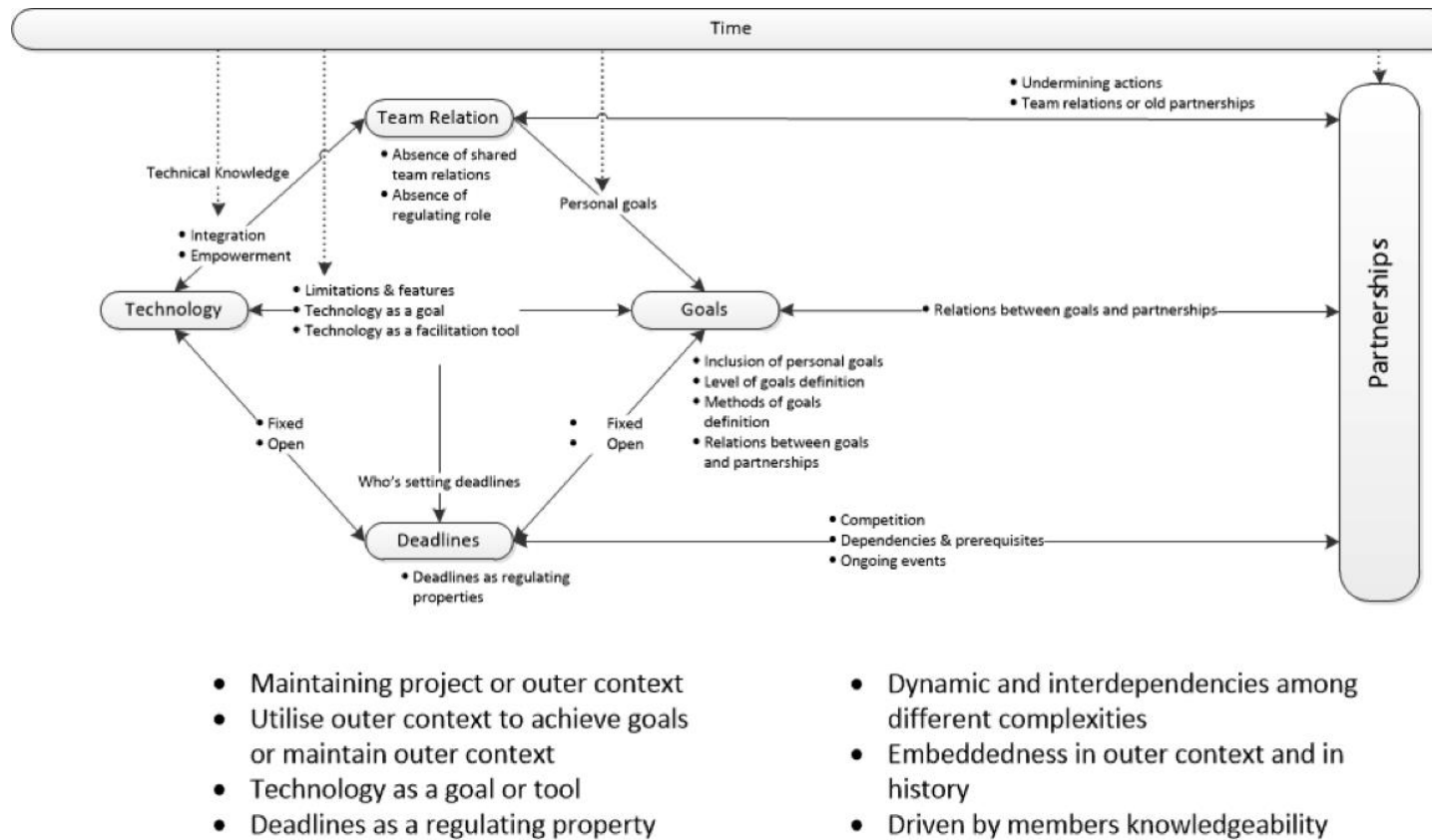


Fig 9.1: Project structuration

9.5.6 Project reflexive monitoring

During project lifecycle, project members are involved in a process of reflexive monitoring of both the project context as well as the outer organisational context. Project members' actions, in the two contexts, are informed by the knowledge obtained from this monitoring process. Within the project context, every member monitors his actions and other members' actions observing their outcomes on team relations, goals, technology and deadlines significations and watching for any unintended consequences leading to unintended changes in adapted project signification and consequently in project structuration. Every project member monitors the external organisational context watching all related projects and events and watching the changes in partnerships among all project participants. Project members knowledge is not only a result of monitoring ongoing activities but it includes past knowledge about existing partnerships as well as personal knowledge and experiences generated from participations in past projects involving knowledge about successfully developed products, failing products, technologies and resources. Project members are challenged in accessing those types of knowledge, which have an effect on their actions and increase the chance of encountering unintended generation of project significations. Those challenges are summarized in table 9.2 which shows the challenges related to project members, absence of organisational and non-organisational support.

Members knowledge	Organisational support	Non-organisational support
Conflicts: <ul style="list-style-type: none"> • Lack of information • Inability to reflect knowledgeability • Mistrusting received information • Members' knowledge is dynamically changing due to receiving new information • Conflicted views about project signification • Unwillingness to participate in project signification 	Conflicts: <ul style="list-style-type: none"> • Having the access to shape project over time (signification – regulation) • Signification is based on hidden knowledge • Incomplete self-project signification • Limiting feedback from members 	Conflicts: <ul style="list-style-type: none"> • Failing to obtain project signification and not engaging in project structuration • Requiring a well-defined goals • Claiming the responsibility of project structuration • Maintaining self knowledgeability • Using technical knowledge to control project structuration

Table 9.2: Learning challenges related to internal and external members

Project knowledge is shared by project members in different types. Members may use specific content tacitly or they may share it in an explicit form. The usages of project content types are different between organisational and non-organisational members. Table 9.3 shows the differences between the two groups.

Organisational members draw heavily on tacit knowledge to generate and exchange project significations, maintain partnerships and obtain regulating rules from senior management. On the other side, non-organisational members prefer obtaining project significations in an explicit form. Organisational members would consider the use of explicit content to complement the tacit exchange of knowledge and to overcome challenges related to tempo-spatial factors such as using emails after working hours. In addition, organisational members prefer receiving explicit regulations controlling their relations with non-organisational members. On the other side, non-organisational members choose to use tacit content during requirements collection, maintaining partnerships and when they want to avoid official commitments. In general, organisational members communicative actions are based on the use of exchanging tacit content in co-presence (face-to-face meetings) while non-organisational members communicative actions are based on explicit content shared in the absence of co-presence or in virtual co-presence (emails).

Organisational	Non-organisational
Tacit as a baseline	Explicit as a baseline
Shared signification Maintaining partnerships Obtaining regulating rules from senior management	End of goals signification (storyboard) Sharing the outcome of technical and deadlines signification
Tacit to explicit	Explicit to tacit
Complementing (after working hours emails) (charts and websites) (prototype) Complaining about absence of regulating rules Regulating unofficially through partners	Collecting goals and technical knowledge Avoiding official commitment Maintaining partnerships

Table 9.3: Differences in the use of content type

On the same vein, there are differences between how various groups and members use co-presence and the reasons for choosing to communicate in co-presence or virtual co-presence. Table 9.4 gives a summary of how and why project members, senior managers and non-organisational groups use co-presence beside the reasons leading them to move to virtual co-presence.

First, project members use co-presence for generating shared project signification allocating a great deal of resources for such communications. Additionally, they use co-presence in their communicative actions with external context to change it to support the completion of project tasks. Project members would only move to virtual co-presence to complement co-presence and to overcome tempo-spatial challenges. Second, senior managers appreciate the use of co-presence but they only allocate little time for co-presence with project members turning co-presence to be a place for passing directions to project

members and to only involve pushing information in one direction.

Additionally, senior managers redirect feedbacks from project team to be communicated through virtual co-presence which saves their limited resources allocated for co-presence. Third, non-organisational members prefer virtual co-presence to collect information and communicate officially with organisational members while they use co-presence to interact unofficially and to avoid commitments and ease conflicts.

The conflict in choosing co-presence or virtual co-presence and the differences in the resources allocated to communicative actions create one of the challenges facing project structuration. First, the conflict is centered on the failure to move between co-presence and virtual co-presence where each group is isolated from other groups and is not able to exchange views and generate shared project signification enabling project structuration to unfold to a generative process. Second, project signification is kept tacit, verbal and contained in co-presence. Therefore, breaking away from co-presence and forcing project members to move to virtual co-presence subject project signification to loss. Third, breaking away from co-presence limits participants to only use explicit content type, which is not preferred by organisational members and is perceived to freeze project signification and not to allow dynamic structuration. Finally, the use of virtual co-presence may be seen as a solution to the less regulated nature of co-presence. However, this is not found to be valid where the use of virtual co-

presence calls for different regulating rules such as the regulation of delays in replying to emails.

In conclusion, co-presence is seen as a context for social integration while the absence of co-presence or virtual co-presence is a context for system integration. Accordingly, project members has shown a preference to handle project structuration through social integration and to use system integration for regulating non-organisational groups putting pressures on them to participate in social integration with project members. On the other side, non-organisational members prefer to handle project structuration as system integration avoiding social integration. They only refer to social integration for maintaining the relationships between the two organisations. In the middle, senior managers fail to establish a way to integrate social and system integrations where they are needed to participate in co-presence to regulate communicative actions between project members and non-organisational members and groups. However, due to their involvements and limited availability, they are not able to fulfill this role and are not able to introduce an alternative in the absence of their co-presence.

Category	Project members	Senior managers	Non-org members
Preference	<ul style="list-style-type: none"> • Preference of co-presence • Allocating much resources on maintaining co-presence 	<ul style="list-style-type: none"> • Preference of co-presence • Dedicating a few little time to co-presence 	<ul style="list-style-type: none"> • Avoiding co-presence
Reasons for using co-presence	<ul style="list-style-type: none"> • Sharing project signification • Influencing partner's actions even changing outer context 	<ul style="list-style-type: none"> • Giving commands and directions (requesting actions) • Turning co-presence to be one way communication 	<ul style="list-style-type: none"> • Avoiding commitment to verbal communications (ease conflict) • Giving wrong technical information
Reasons to move to virtual co-presence	<ul style="list-style-type: none"> • Overcome tempo-spatial • Complement co-presence 	<ul style="list-style-type: none"> • Restricting feedbacks to emails 	<ul style="list-style-type: none"> • Official communication • To collect information

Table 9.4: Differences between co-presence and virtual co-presence

Chapter Ten: Conclusion

10 Conclusion

10.1 Introduction

In this study, it is argued that project is a complex phenomenon embedded in the surrounding context and driven by learning across space and time. First, Project complexities are related to four main project properties (goals, deadlines, methods and team relations). Second, project embeddedness is represented in the interactions between project members and non-project members such as: senior managers, end-users, vendors and contractors.

Drawing on Structuration Theory, this study merges the three project features (project complexity, embeddedness and learning) into one integral view emphasising the social, dynamic and recursive process of shaping and re-shaping project trajectories across space and time. Different project complexities are found to be interrelated and affecting each other. They are shaped and re-shaped through a recursive process involving interactions between project members and non-project members. Finally, project members' abilities to shape and re-shape project trajectories are informed by their knowledgeability about project internal complexities and project relationships with the surrounding environment, bounded by learning challenges.

In the following sections, the research conclusion is provided. The contributions of this research theoretically to the new project management literature,

methodologically to ethnographic studies through the introduction of a self-ethnography, and contextually to the studies of the context of Saudi Arabia are discussed. Finally, the implications for future research are introduced.

10.2 Contributions of the Research

As shown in the project management literature review in Chapter Two, three approaches and streams are identified contributing to the body of new project management literature. The first approach developed a view to projects as complex phenomena where project management explores and investigates project internal complexities (Williams 2003, 2004). The second approach is interested in investigating the embeddedness of projects in the surrounding organisational context. The third approach is interested in projects as a suitable context for learning.

Within this context, this study proposes a theoretical development of an integrative view to projects where both internal project context and external surrounding context are linked. Meantime, learning challenges affecting project members' knowledgeability are addressed. According to this proposed view, project members do not independently shape project trajectories across space and time independently from non-project members interventions. Meantime, non-project members' actions undermining project context are not accepted without being challenged by project members. This study views project

trajectories as results of series of interactions between project and non-project members where those interactions are informed by members knowledgeability resulting from monitoring the internal project context and the surrounding context. This was demonstrated in this study when non-project members' actions undermining project context were not accepted without being challenged by project members.

This study builds upon views about project complexity (Baccarini 1996, Williams 1999 2003) exploring the dynamics and interrelatedness of different types and sources of project complexities. Similarly, this study builds upon the project embeddedness literature. Normally, those studies are interested in one specific role: for example some studies concentrate on the role of senior management in project management (Johns 1999, Gray 2001, White and Fortune 2002, Gray and Larson 2003) while other studies concentrate on end users role (Jiang et al. 2002). This study sheds lights on multiple non-project roles identifying their interactions with project members and effect on project progress.

Structuration theory has played an important role in achieving this study target answering the research questions and integrating complexity, embeddedness and project learning approaches. Building upon structuration theory, project is perceived as complex (organisational complexity, structural complexity, technical and technological complexity and time-related complexity), dynamically structured, embedded in an outer context and is driven by members' knowledgeability. Structuration theory succeeds in this through stressing on the social and dynamic nature of project phenomena. It gives a special attention to how project complexity, embeddedness and learning are recursively inter-related. In addition, it shows the interrelatedness between the four project complexity dimensions. Meanwhile, structuration theory does not focus on a specific type of participants such as project manager rather it is interested in the participation of all members in project structuration.

This study is focused on returning to structuration theory escaping from the various adaptive versions introduced under the name of structuration theory. It gives an example of using structuration theory as a meta-theory and selectively choosing specific concepts as 'sensitizing devices' showing how empirical work benefits from structuration theory high level of abstraction and numerous concepts. Additionally, this study shows how researchers benefit from the relative autonomy offered by Giddens between theory and empirical work where researchers utilise to respond to the locality and particularities of the studied context.

Although this study is situated in to a specific Saudi context and related to a specific organisation and three specific projects, an abstract view can be obtained to draw attention to the importance of studying project complexity, embeddedness and learning. Although no precise conclusions can be drawn and borrowed to be applied in different contexts, this study uses Giddens' structuration perspective (Giddens1984) to develop an abstract understanding and view of the formation of project trajectories, showing how the three project features are involved in a recursive relationship across space and time. The integrative view of project phenomena is proposed to be used to understand project work in different contexts.

In developing a self-ethnography over twelve months in a Saudi organisation, this study responds to the call of conducting longitudinal studies to examine social changes in the context of Saudi organisations (Al-Yahya 2009). At a more general level, by investigating IS project work in a Saudi organisation this study makes a contribution towards filling in the gap in organisational studies and social science in general left by the paucity of studies addressing the context of Saudi Arabia (Badawy 1980, Ali 1993, Al-Yahya 2009).

10.3Future Works

This study has shown project trajectories across space and time, characterising the project as an embedded complex phenomenon driven by project members

learning. This lays a foundation for future work to identify the relation between project trajectories in terms of complexity, embeddedness and learning for specific project implementation phases (such as initiation, design and implementation) and the way in which project members' significations of each stage affect their actions.

On the other hand, this study shows project trajectories by participating as a project member in the three projects. Therefore, it is suggested that future works may investigate project phenomenon from the outer perspectives participating as a non-project member. These include the perspectives of end-users, senior managers, contractors and vendors.

On the other hand, understanding the different perspectives of various project and non-project members at the same time may shed lights on the phenomenon of projects. However, this may be difficult in a self-ethnographic study because of the difficulty of participating with all participants at the same time. Therefore, different research methods may be applied to capture all informants' views such as interviewing.

On the Saudi context level, the study of IS project work in Saudi Arabia is expected to be enriched by conducting more longitudinal studies. These studies are suggested to investigate the effect of cultural differences on project trajectories which is seem to be seen through the involving different overseas vendors' contractors and vendors. Meanwhile, it is suggested to investigate the

differences between vendors and contractors working remotely and those who have teams working in Saudi workplaces.

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